



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4799



GRADUATE EDUCATION
(301) 295-3913
X: (301) 295-6772

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Name of Candidate: Linda Weiss
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Dissertation and Abstract Approved:

Jerome E. Singer
Committee Chairperson

31 July 1996
Date

[Signature]
Committee Member

7/31/96
Date

Carol L. Reddick
Committee Member

2 Aug 96
Date

[Signature]
Committee Member

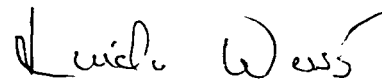
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A handwritten signature in black ink, appearing to read "Linda Weiss". The signature is fluid and cursive, with a long horizontal stroke at the end.

Linda Weiss
Department of Medical and
Clinical Psychology
Uniformed Services University
of the Health Sciences

Abstract

Title of Dissertation: Acute and chronic stress: The effects of loss of control.

Linda Weiss, Doctor of Philosophy, 1996

Dissertation directed by: Jerome E. Singer, Chair
Department of Medical and Clinical Psychology

Long-term unemployment, often accompanied by homelessness, has been identified as a chronic stressor affecting the health and well-being of the unemployed and their families. This study was designed to test how loss of control associated with chronic unemployment generalized to, and affected response subsequent acute stressors increasing the likelihood of the development or exacerbation of stress-related physical and emotional distress.

Eighty-four male subjects participated in this study forming three groups based on current employment status: short-term (unemployed for less than two months); long-term (unemployed for longer than two months); and, employed controls. Perceptions of control over the laboratory stressor were manipulated by randomly assigning half the men in each group into no control or perceived control conditions resulting in a 2 X 3 factorial design. Subjects were exposed to loud, intermittent noise while working on three types of tasks; the effects of exposure to this stressor were assessed by performance and persistence on a cognitive task. Blood pressure and heart rate were used as measures of cardiovascular responses to stress, and self-report provided data on somatic complaints, psychological response, and distress.

Chronic stress associated with long-term unemployment was hypothesized to be related to elevated psychophysiological symptoms and that attendant loss of control would generalize to the laboratory stressor resulting in performance deficits and helpless behavior.

As predicted, compared to the other two groups, long-term unemployed subjects had higher cardiovascular baseline readings, a greater number of stress-related symptoms, and persisted less on the aftereffects task. The control manipulation did not yield significant differences or interactions between or within the three groups. Although these findings confirmed that long-term unemployment is a chronic stressor; self-report data on task appraisals and control did not completely support the hypotheses that loss of control associated with chronic unemployment generalizes to acute laboratory stressors or results in symptoms of helplessness. Alternative interpretations of these data are discussed, particularly the prevalent use of denial as a means of coping with long-term unemployment.

**ACUTE AND CHRONIC STRESS:
THE MEDIATING EFFECTS OF LOSS OF CONTROL**

by
Linda Weiss

Dissertation submitted to the Faculty of the Department of Medical and
Clinical Psychology Graduate program of the Uniformed Services
University of the Health Sciences in partial fulfillment of
the requirements for the degree of
Doctor of Philosophy 1996

Dedication

To L. J., C. S., and K. P. for helping me to appreciate this time in my life as a period of wonderful growth, learning, and gentle understanding. Stephen, without you, this would not have been possible.

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No research endeavor is completely the work of one individual. In addition to my family, I would like to acknowledge those individuals without whom this study would not have been possible. During the initial stages, my peers and the faculty helped me translate questions into testable hypotheses. I am indebted to Laura Klein and the University technicians for their work in creating the laboratory setting for this research. Kathryn Popp has remained a dear friend and colleague via the telephone. She was always there to listen to and help hash out the multitude of problems that arose during this study.

Carol Fullerton graciously agreed to act as one of my committee members despite her overwhelming work load. Her comments and participation during this dissertation process have been supportive and thoughtful. I am at a loss to adequately thank David Krantz for his time and effort in refining my rough proposal and agreeing to chair my committee. Neil Grunberg's help encompasses much more than his work with me as a reader and committee member; his concern and tutelage during my years at USUHS are invaluable assets I will carry with me during my career. Jerry Singer has always made time for me when I have needed advice or guidance during my graduate studies. He has been a constant source of encouragement and stability during my years of study. I feel honored to have been his student.

Lastly, this project would not have been possible without the men who volunteered to participate in this study. Despite my odd schedule, they kept appointments, patiently answered questionnaires, endured the laboratory stressors, and showed a genuine interest in the purpose and outcome of this research.

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Introduction

The prevailing economic, social, and environmental conditions of daily life are inherently stressful. Research has indicated that stress in the form of major life events can affect health and well-being (Rahe, 1975). In addition, the everyday hassles one encounters as part of his or her daily routine has been associated with health problems and mood disturbances (DeLongis, Folkman, & Lazarus, 1988). More disruptive situations or events such as global economic instability, unemployment, and inflation present an increasingly pervasive source of chronic stress. Thus, it is likely that a significant portion of the population suffers not only from acute disruptions of their daily routines but are subject to the consequences of exposure to chronic stressors and may often feel they have lost control over significant aspects of daily life.

Unemployment is one of the consequences of the larger social issue of economic instability affecting not only the jobless but society as a whole. Research has suggested that job loss is related to increased incidence of stress-related health problems and that prolonged joblessness is associated with symptoms of chronic stress (Baum, Fleming, & Reddy, 1986; Cobb & Kasl, 1977; Hepworth, 1980).

Although unemployment in the United States is substantially lower than it has been during the past two decades, the U.S. Department of Labor revealed that in June 1996, nearly seven and three quarter million Americans were out of work. Most were not jobless by choice.

Lay-offs, forced early retirements, and retrenchment due to economic cut-backs in both private and public sectors account for the majority of those out of work.

The effects of unemployment are similar to those of other sources of stress. Warr (1984a) reviewed the evidence suggestive of an increase in psychosomatic complaints. Kasl and Cobb (1970) found sustained sympathetic arousal measured by cardiovascular response (particularly during anticipation of, and six months following, job loss). Jacobson (1987) has shown that during unemployment, an individual struggles to redefine and attempts to cope with previous unchallenged assumptions about his or her role or position relative to the environment brought on by the abrupt transition accompanying job loss.

Consider an individual who suddenly loses his or her job and remains unemployed for some length of time. Being unemployed results in an immediate inability to control financial income that may have negative cascading effects into other areas of a person's life. For example, a drastic reduction in income may lead to conflict in social or marital relationships as well as decreased feelings of self-esteem. Unemployment may also lead to frustration as an individual persists but fails to find another job.

The notion that chronic stress may affect response to subsequent stressors is consistent with Selye's (1946) process model of stress. Similarly, Glass and Singer (1972) suggested that the cognitive work required to adapt to unpredictable or uncontrollable stimuli are likely to result in depletion of coping responses

resulting in deficits on later tasks. In describing his theory of cognitive fatigue, Cohen (1980) similarly posited that information overload resulting from exposure to a prolonged stressor may result in insufficient reserves to attend to a subsequent task. Therefore, control perceived by an individual, is an important mediating factor influencing whether or not an environmental event is appraised as a stressor. If so, does one believe he or she has the resources available to reduce or eliminate its negative effects (Folkman, 1984; Geer, Davison, & Gatchel, 1970; Glass & Singer, 1972; Langer, 1983)? Investigations examining response to acute stressors have reported that subjects who believed they could control a given situation exhibited fewer stress-related symptoms and behavioral deficits than participants having no control (Glass & Singer, 1972; Langer, 1983). Conversely, loss of perceived control has been associated with elevations in sympathetic arousal, impaired task performance, and helpless behavior (Abramson, Seligman, & Teasdale, 1978; Davidson, Baum, & Collins, 1982) suggesting that perceiving control may reduce stress-related symptoms, whereas losing control tends to increase the effects of a stressor.

The research reported in this dissertation examined several psychological mechanisms by which chronic unemployment may exacerbate response to other on-going or future acute stressors. Specifically, it was hypothesized that loss of control associated with chronic unemployment would negatively affect appraisal of acute laboratory stressors and inhibit effective coping. Further, response to these

subsequent stressors would be directly mediated by the loss of control associated with chronic unemployment resulting in increased deficits in behavioral performance and pronounced symptoms of helplessness.

This dissertation research is partially based on a study conducted by Baum and colleagues (1986) that examined unemployment stress and its relationship to loss of control and learned helplessness. Their findings suggested that subjects unemployed for longer than two months evidenced symptoms of chronic stress and that, contrary to expectations, most of those studied did not appear to adapt to joblessness. These investigators manipulated expectations of control by showing subjects several series of slides, and providing them with either veridical or nonveridical feedback on their performance. Each slide presented during this task showed two figures. The object of the task, was for the participants to determine which of five possible parameters was the correct one for a given series (Levine, 1975).

Data from this study indicated that employed (controls) and all unemployed subjects receiving veridical feedback showed similar psychophysiological and behavioral response patterns to a subsequent task, whereas response patterns significantly diverged among those receiving nonveridical feedback. Control and short-term unemployed subjects evidenced increased urinary catecholamines and reactant behavior on a subsequent task while those unemployed longer than two months showed decreases in catecholamine levels, indicative of a lack of sympathetic arousal, and helpless behavior. In their discussion of the self-report

data, Baum and colleagues (1986) suggested the possibility that long-term jobless subjects who received nonveridical feedback may have been previously exposed to noncontingent relationships while unemployed (e.g., repeated, unsuccessful job searching). If this were the case, then this exposure may have resulted in a quicker recognition of the lack of relationship between responses and outcomes among these subjects during the Levine (1975) task. The present study attempted to extend these findings (Baum et al., 1986) by first confirming that long-term unemployment is associated with symptoms of chronic stress using different indices of sympathetic arousal. In addition, this study investigated how loss of control associated with chronic unemployment generalizes to subsequent acute stressors by adversely affecting appraisal and coping processes.

The theories and research leading to the present study are discussed beginning with an overview of the stress literature showing how basic biological research led to the conceptualization of stress as a process. An outline of the psychological theory of stress developed by Lazarus (1966) serves as an introduction to the research on how the cognitive processes of appraisal, coping, and perceptions of control mediate stress responding. Next, studies examining the effects of exposure to acute and chronic stressors are reviewed to show how specific factors and characteristics related to these stressors result in response differences. This discussion includes a review of the research on the effects of

unemployment that supports the notion that long-term unemployment is associated with chronic stress and loss of control. Finally, this dissertation research is described and its findings presented.

Stress

Stress is an interactive process during which environmental events or conditions, termed stressors, threaten an organism's existence or well-being and the organism responds to the threat (Baum, Singer, & Baum, 1981). Intuitively, many situations occur that may threaten some people but pass unnoticed by others. It is also likely that a given event may represent varying degrees of threat. It follows that how an individual appraises a specific environmental condition both precedes and is an integral part of stress. This process is dynamic and affected by psychophysiological mediators, past experience with similar events, and day-to-day situational factors. Stress has been implicated as a direct causal agent in physiological damage linked to diseases of life-style and has been shown to alter the course of illness (Kasl & Cobb, 1966a, 1966b; Krantz, Glass, & Snyder, 1974; Selye, 1976).

Biological theories of stress. Dating back to ancient Greek civilization, observations have suggested that an organism's efforts directed toward attempting to resist or ward off illness affects the course and severity of disease. This notion led to the pioneering work on stress beginning early in the twentieth century. The first experimental studies of stress conducted by Walter Cannon revealed that activation of the sympathetic nervous system (SNS) facilitated an organism's

response to a threatening situation. Cannon (1914) argued that this physiological arousal or readying response was adaptive and necessary to survival; it helped the organism to either fight or flee from the source of danger. Further studies by Cannon (1935) found that emotional response to stressors disrupted physiological equilibrium suggesting that emotional as well as physiological arousal played an adaptive role but could result as well in distress and impaired bodily function.

Selye (1946) developed a pathogenic model of stress based on his findings that a triad of physiological changes were elicited in animals exposed to a variety of noxious agents: enlargement of the adrenals, shrinkage of the thymus and lymph glands, and gastrointestinal ulceration resulting from numerous stressors. This pattern of changes was brought about by stimulation of the endocrine system, primarily increases in secretion of the corticosteroids. Selye contended that this pattern was nonspecific because all induced pathogens produced the same physiological changes.

Based on these observations, Selye (1946) proposed a three-stage process model of stress, the General Adaptation Syndrome (GAS). During the alarm stage of the GAS, the organism mobilizes its resources to combat the physical demands of a stressor. This is followed by a stage of resistance during which coping mechanisms serve to reduce the still present threat. If coping is adequate, adaption is achieved, and the body returns to homeostasis. If the stressor persists or is

repetitive, coping resources may become depleted and the organism may enter a stage of exhaustion. At this point, resistance becomes ineffective, physiological function is compromised, and the body becomes highly susceptible to disease.

The GAS is based on the proposition that the body can cope with stress but the coping process may tax a person's ability to contend with persistent or subsequent stressors. Selye's theory has three important implications: that the effects of stress are cumulative; that these cumulative effects can tax or exceed the organism's adaptive resources; and, that the effects of stress are additive drawn from the supposition that response to different stressors are the same (Fleming, Baum, & Singer, 1984).

Cannon's research, and to a greater degree Selye's theory, broadened scientific interest in the study of stress. This biologically based research confirmed that stress directly affected physiological function; that emotional states influence physiological changes occurring during stress; and that the cumulative effects of stress can inhibit or prevent adaptation. Although early studies on how psychological factors affect the stress process were still based on biological models, this research provided an integrative perspective and represented a pivotal point in the study of stress.

Selye's research was based on indirect and relatively non-specific measures such as glandular weight and histology or the metabolic effects of hormones (Mason, 1971). Methodological advances during the 1950's allowed investigators to obtain direct measures of adrenal cortical hormones in plasma and urine,

confirming that diverse noxious stimulation was often associated with elevated levels of corticosteroids (Mason, 1975). Research reported by Mason (1968a, 1968b, 1968c, 1974) challenged Selye's notion of nonspecificity and demonstrated that emotions are potent stimuli increasing pituitary-adrenal cortical activity.

In a review of psychoendocrine research, Mason (1968c; 1971) argued that instead of hormonal responses being elicited by diverse stimuli, these responses were actually elicited by a single or stimulus class, that being those factors that elicit emotional arousal or distress. Mason further suggested that Selye's unidentified first mediators of stress may have been a product of psychological factors associated with non-specific arousal to noxious or novel stimuli. In testing this hypothesis Mason (1968b) demonstrated that emotional arousal was characteristically associated with multiple endocrine responses in laboratory animals. In a later study, Mason and his colleagues (1976) demonstrated that ambiguous or uncertain threats were associated with increased secretion of the catecholamines and cortisol, while threat producing anger or fear (a focused, signaled stressor) resulted in increases in norepinephrine and cortisol only. This suggested that not only was response to threat somewhat specific but that psychological awareness of threat preceded physiological activation.

Frankenhauser, Mellis, Rissler, Bjorkvall, and Patkai (1968) extended Cannon's concept of a readying response by demonstrating that sympathetic nervous system (SNS) arousal affected emotional and cognitive functioning and changes in urinary catecholamine secretion could be seen in response to

psychological events. Subjects in this study watched a natural scenery film (inactivity) and then the following day worked on a conflict task (stress). Urine samples collected before and after each session indexed sympathetic arousal, with self-report measures providing data on emotional states and cognitive function. Analyses revealed significant differences between inactivity and stress values for both catecholamines. Those subjects grouped as excreting high values of epinephrine and norepinephrine performed better throughout the task, increased their estimates of subjective performance and aspiration, and showed a decrease in estimates of stress and irritation when compared to the low-excretion groups. This pattern was also found when subjective performance was plotted against estimates of stress and irritation.

Psychological theory of stress. Data from these and other biologically-based models formed the foundation for psychological research on the stress process. Broadly, these investigations focused on the interaction between stressors and the interpretive and evaluative processes drawn upon by an individual. More specifically, psychological factors were examined both in terms of mediating response to physical stressors and as stressors themselves (Baum, et al., 1981).

The cognitive or psychological theory of stress developed by Lazarus and colleagues proposed that the processes of appraisal and coping mediate stress and stress-related outcomes (Lazarus, 1966; Lazarus & Folkman, 1984; Lazarus & Launier, 1978). This theory posits that a person's psychological structure and the cognitive features of the stimulus situation are essential components of the stress

process. A review of the research examining the appraisal and coping processes as well as perceived control will demonstrate how psychological mechanisms mediate stress responding and often act as stressors in and of themselves.

Stress mediators

Appraisal. Lazarus and colleagues (Coyne & Lazarus, 1980; Lazarus, 1981; Lazarus & Folkman, 1984) defined stress as a relationship between a person and a specific environment that has been appraised as personally harmful or threatening, and as taxing or exceeding that individual's coping resources. Stress, according to their formulation, is a dynamic process as well, wherein the relationship constantly changes as the individual and the specific environment act on each other.

The appraisal process determines whether an event is evaluated as stressful or benign, enables the person to choose effective coping strategies, and allows for the continual changing nature of the person-environment relationship to be reappraised and successfully managed (Lazarus, 1981). Lazarus and colleagues demonstrated that by manipulating a person's appraisal of a stressor, physiological arousal could be augmented or reduced (Lazarus, Opton, Nomikos, & Rankin, 1965; Speisman, Lazarus, Mordkoff, & Davison, 1964).

Lazarus' theory distinguished between primary and secondary forms of appraisal. Both are discrete and complementary sources of knowledge necessary for the individual's assessment of whether or not a given situation has personal significance (Lazarus, 1981; Lazarus & Folkman, 1984; Lazarus & Launier, 1978).

Primary appraisal consists of judgments concerning the relevance of an event to an individual's well-being, as well as the degree to which an event is perceived as harmful, threatening, or challenging. Secondary appraisals include evaluation of personal resources and options necessary to reduce the aversive consequences of exposure (e.g., Coyne & Lazarus, 1980; Lazarus, 1981). Both are a function of a person's beliefs, resources, and the situational context.

Coyne & Lazarus (1980) suggested that harm-loss (damage already sustained) and threat appraisals shift as the person appraises and reappraises past harm and concurrent threats to well-being. Challenge interpretations are characterized by the belief that the stressor, although taxing, can be dealt with effectively. Individuals predisposed to appraise stressors as challenging are likely to have greater confidence in their ability to adapt to disruptive events. Thus, it is likely that these individuals will respond differently than those tending to view events as threatening or harmful.

Once a situation has been appraised as personally relevant and determinations have been made concerning its typology, attention is turned toward the evaluation of what resources (if any) are available to the individual to reduce the impact of the stressor. These resources include physical, social, psychological, and material assets an individual can bring to bear in order to meet the demands of the situation (Folkman, 1984). The coping process is the dynamic use of resources and options taken by an individual to reduce the aversiveness of the stressor.

Coping. Coping is defined as cognitive and behavioral efforts to manage the specific environmental or psychological demands created by a stressful transaction (Lazarus & Folkman, 1984). The same cognitive and individual-difference factors influencing the appraisal process also determine the coping strategies adopted by the individual. Thus, people may tend to cope with all stressors with a static set of strategies, or may tailor their coping efforts to meet the specific demands of different stressors (Gatchel, Baum, & Lang, 1982). Coping represents a person's efforts and is independent of the success or failure of the strategies that are used. Four basic coping strategies have been identified: taking direct action, managing emotional response, seeking information, and inaction (e.g. Coyne & Lazarus, 1980; Folkman & Lazarus, 1980; Lazarus & Launier, 1978).

Folkman and Lazarus (1980) examined patterns of coping across diverse stressful events as well as several factors that influence the coping process in a sample of middle-aged men and women. Coping strategies were categorized as either problem- or emotion-focused using a modified version of the Ways of Coping checklist (Lazarus & Launier, 1978). Factors influencing coping included the stressful situation itself, the person(s) involved and its context, appraisal of the stressor, age, and gender. The data revealed that both problem- and emotion-focused coping were used in every stressful episode. Analyses of coping patterns indicated the subjects showed a much higher degree of variability than consistency, with appraisal and the situational context independently accounting for these results. Although gender differences were apparent between situational

contexts, analyses showed that within a specific context there were no differences between men and women in coping, nor were gender differences found in the way participants appraised the stressful events.

Research conducted by Baum, Calesnick, Davis, and Gatchel (1982) examined response to crowding stress using Mehrabian's (1977) notion of stimulus screening as an individual difference construct in coping with overload. Data showed that screeners used a problem-focused approach, organizing and prioritizing situational demands. Nonscreeners who took an emotion-focused approach appeared more affected by crowding stress, making more reference to being upset, anxious, or unhappy than their screener counterparts.

In 1992, MacNair and Elliott reported their findings on how self-perceived problem-solving ability affects stress and coping. Since approach-avoidance (AA; Heppner & Petersen, 1982) and personal control are influential factors in how a person perceives his or her problem-solving ability, these relationships were examined as well, in terms of the use of problem- and emotion-focused coping. Subjects were categorized as effective or ineffective problem solvers based on their responses (median split) to the Problem Solving Inventory (PSI; Heppner & Petersen, 1982). A questionnaire assessing primary appraisal, secondary appraisals, and coping strategies to a specific self-reported stressor were completed by the subjects three times at 2-week intervals.

The data indicated that self-perceived problem-solving skills were related to consistent use of coping strategies; subjects perceiving themselves as effective problem-solvers reported more use of problem-focused strategies while those viewing themselves as ineffective, endorsed more emotion-focused strategies across all three stressors. Higher AA scores (more ability) were significantly correlated with use of problem-focused strategies but not with emotion-focused coping. Low scores on the control factor of the PSI were correlated with a tendency to use more emotion-focused strategies suggesting that perceived difficulty in regulating emotions in stressful situations is related to self-reported ineffective problem-solving ability. This finding supports other data indicating that uncontrollability is associated with less effective coping and stress-related symptoms (e.g., Folkman, 1984; Lazarus & Folkman, 1984; Glass & Singer, 1972).

A study on the effects of daily hassles and coping styles on psychological health in a community sample revealed that daily hassles were related to increases in psychological symptoms even after controlling for prior symptoms levels (Lu, 1991). The hassles scale used in this study was revised to include only undesirable events. Redundant items and phrases suggestive of psychological and somatic symptoms were also eliminated. Subjects completed three self-report measures twice, over a three month period; the modified hassles scale, a version of the Ways of Coping (Lazarus & Launier, 1978) and a measure of psychological symptoms experienced during the six weeks prior to each assessment. The data indicated that women tended to use less direct and suppression (i.e., denial or

avoidance) strategies compared to men who reported more use of direct (i.e., problem-focused) coping appearing to be more adaptive in routine disruptive situations. This study is particularly relevant to the current research in that some of these subjects were unemployed. In Lu's study, those who were jobless tended to use less direct coping strategies and reported more psychological distress, suggesting a relationship between unemployment, other sources of stress, and coping.

The research on the coping processes suggests that both emotion- and problem-focused coping are used in response to a variety of stressors and, in some cases, it appears that problem-focused coping is a more effective strategy. There is evidence, however, suggesting that emotion-focused coping can be adaptive as well, particularly when a stressor persists and cannot be easily changed.

Research examining response to the Three Mile Island (TMI) nuclear disaster showed that subjects who employed emotion-focused strategies evidenced significantly lower symptoms of stress than problem-focused copers up to two years following the accident (Collins, Baum, & Singer, 1983). These authors further distinguished between two styles of emotion-focused coping and their relationship to symptoms of chronic stress by initially deriving two additional subscales from the Ways of Coping scale (Folkman & Lazarus, 1980) to measure the use of denial and emotionally-based reappraisal. In testing these scales (nine items taken from the emotional subscale) it was found that endorsement of one denial item, "I refuse to believe what is happening" and one reappraisal item, "I concentrated on something

good that could come from this" on each of these scales was sufficient to differentiate between subjects using these strategies. It was found that TMI subjects who used denial as opposed to reappraisal reported more symptoms and solved fewer task problems.

The effectiveness of information-seeking as a coping strategy has been well documented in studies examining stress in medical settings (e.g., Cobb, Clark, McGuire, & Howe, 1954; Grinker, Willerman, Bradley, & Fastovsky, 1946). Janis (1958) conducted several pioneering studies on stress associated with surgery. Data from one study revealed that subjects who demonstrated moderate anticipatory fear regarding impending surgery sought more information from the hospital staff and evidenced less postoperative distress than subjects who were higher or lower on this dimension.

Andrew (1970) found that a group of patients exposed to a brief informational message prior to surgery recovered more quickly and required fewer medications. Johnson and Leventhal (1974) demonstrated that sensory and coping strategy information prior to an endoscopy was effective in reducing distress. A study by Johnson (1973) revealed that sensory and procedural information regarding surgery reduced distress, decreased requests for pain medication, and resulted in shorter hospitalizations. People may also choose a passive response when they judge an active response may only make matters worse. Another reason for this style of coping has been suggested by the work of Weiss (1971a; 1971b). Using an animal model, he found that the degree of stress experienced by his subjects was a

function of the number of coping attempts made to reduce or avoid noxious stimulation and the amount of relevant feedback from the coping efforts. Weiss found that rats who remained passive during stimulation did not exhibit as many stress symptoms as those animals involved in active coping responses. This research suggests that if organisms using a passive coping style find themselves in a less stressful state, they may be likely to employ this strategy again and would resist attempts by others to provoke active coping strategies (Wortman & Brehm, 1975).

The most systematic studies on coping behavior have been conducted by researchers examining the relationship between stress and cardiovascular disorders. Raab and his colleagues found evidence that increased sympathetic arousal associated with stress was related to arterial damage and the development of myocardial lesions in laboratory animals (Raab, Chaplin, & Bajusz, 1964; Raab, Stark, MacMillan, & Giguee, 1961). In 1974, Friedman and Rosenman identified a coronary-prone behavior pattern (Type A) that appeared to be linked to coronary heart disease (CHD). These and other studies led to the development of a major research program designed by Glass (1977) to investigate the relationship between psychological stress and CHD.

The Type A pattern is exhibited during both the appraisal and coping processes. The Type A individual is more likely to interpret situations as threatening, particularly when the appraisal suggests a loss of control (Glass, 1977). As a coping style, Type A is defined by extreme vigilant behavior against

threats to control, and hyper-responsiveness when actual threats to control materialize (Glass, 1977). Glass and colleagues (1980) found that among Type A men, behavioral response to task overload (threatening control) is aggressive, hostile, and time-urgent with physiological response characterized by dramatic increases in blood pressure and blood catecholamine levels. Research on the relationship between stress and cardiovascular disease is extensive and beyond the scope of this literature review. However, Glass' description of this coronary-prone behavior pattern as a characteristic style of responding to environmental stressors that threaten an individual's sense of control exemplifies the important mediating influence of control in the study of stress.

Control. Control has been defined in terms of self-competence, effectance motivation, and self-efficacy (e.g., Bandura, 1977; de Charms, 1968; White, 1959). More simply put, control is the perception of contingency between performance of a behavior and the ability to successfully manage an event or stressor. Thus, uncontrollability is the perception of no contingency between one's response and successful management of a stressor (Gatchel, 1980).

In a paper reviewing the relation between control and the impact of stressful events, Thompson (1981) offered a more cognitively- oriented definition of control and proposed a new typology bridging gaps in earlier work by Averill (1973) and Miller (1979). Thompson (1981) described control as a belief that a person has at their disposal responses capable of reducing the aversive consequences of a stressor. This definition includes all forms of control, and suggests that control

need not be exercised but may simply be perceived to produce desired effects. She formulated a fourfold typology which included the belief that there is some type of behavioral response available to the individual that will reduce the impact of an aversive event; that one can control adverse effects by using cognitive strategies; that negative effects of a stressor can be minimized by gaining relevant information about the stressor, in the sense that it engenders feelings of control; and, that retrospective attributions made regarding the causes of a past aversive event may serve to reduce the likelihood of experiencing long-term stress.

The construct of control has generated several theories and has been the major independent variable in many studies (e.g., Kelley, 1955; Lerner & Miller, 1978; Rotter, 1966). It has become evident that having control does not necessarily reduce stress responding (Averill, 1973). Conversely, the mere illusion of control can reduce the impact of aversive events (e.g., Glass & Singer, 1972; Langer, 1983; Lefcourt, 1973). Two theories of control have particular relevance to this study.

Reactance theory

Reactance theory proposed by Brehm (1966) posits that threat to personal freedom results in a motivational state (reactance) impelling a person to restore their sense of freedom. Reactance is considered to be a function of the expectation that freedom is a quality one possesses, the degree to which this freedom is

threatened, the personal significant of the freedom that is threatened, and the significance of a given threat to other freedoms (Wortman & Brehm, 1975). Reactance theory is, therefore, directly relevant to uncontrollable outcomes.

According to Wortman and Brehm (1975) several predictions can be made concerning the evaluation of uncontrollable outcomes, the individual's behavior toward such outcomes, and mood. When freedom to engage in a behavior is threatened, motivation to restore freedom will increase and people will attempt to restore it by engaging in a previously threatened or eliminated behavior. Secondly, when behavioral freedom has been threatened or eliminated, the individual is likely to experience hostility or aggressiveness toward the responsible agent.

Learned helplessness theory

The second theory of control relevant to this current study is Seligman's model of learned helplessness derived from animal studies examining response to uncontrollable and inescapable shock (e.g., Overmier & Seligman, 1975; Seligman, Maier, & Geer, 1968). The term learned helplessness was used to describe the interference with escape-avoidance learning produced by the delivery of inescapable or uncontrollable shock, as well as the process underlying this behavior; learning that responses and reinforcements are independent. Experiments using learned helplessness training in humans have demonstrated how this theory accounts for response to loss of control.

For example, a study was conducted by Hiroto and Seligman (1975) to investigate whether learned helplessness impaired performance only on tasks similar to a training task or if this training resulted in a generalization to dissimilar impaired behaviors. Subjects were exposed to one of the following conditions: instrumental pretreatment, task-instrumental testing; instrumental pretreatment, cognitive testing; cognitive pretreatment, instrumental testing; or cognitive pretreatment, cognitive testing. In each condition those subjects receiving escapable (solvable) pretreatment were yoked to the group that received inescapable (insolvable) pretreatment. Correctly pressing a button in the instrumental pretreatment allowed subjects to escape aversive noise. In the cognitive pretreatment, subjects worked on concept formation problems; contingent feedback on these problems helped subjects in the solvable condition to identify the correct concept and escape the noise, while random noncontingent feedback had the opposite effect for those in the insolvable condition. The control groups were merely asked to listen to the noises without performing a task. All subjects were exposed to 45 unsignaled trials with a loud noise. In the test sessions the instrumental task allowed subjects to escape noise by moving a handle, with the cognitive task being a same letter sequence series of 20 solvable anagrams. Dependent measures included number of trials to escape, failures to escape, and the mean response latency.

Results indicated that in the groups involving instrumental pretraining followed by cognitive or instrumental testing and cognitive pretraining, instrumental testing subjects who received inescapable or insolvable pretraining performed significantly worse on most of the test measures than those who received escapable or solvable pretraining and no treatment control groups. The cognitive training, cognitive test situation originally produced no significant differences between groups; however, repeating this study with more extensive pretraining revealed the predicted differences. Hiroto and Seligman (1975) concluded that these findings not only demonstrated learned helplessness but that this phenomenon generalized to test tasks different than those used in pretraining.

Wortman and Brehm (1975) noted that though these studies provide support for the learned helplessness model, the generalization effect was somewhat tenuous. First, both training and test tasks involved some form of problem solving. Secondly, response to a post-experimental questionnaire indicated that subjects exposed to uncontrollable pretreatments perceived the task as more insolvable than those who could escape the noise or solve the problems despite having been told by the experimenter that the task was solvable. This appears to imply that these subjects did not believe the experimenter when told the test task could be solved.

Integration of reactance and learned helplessness theories

Although reactance theory and the learned helplessness model address response to uncontrollable outcomes, differences in experimental methodology tend to obscure the underlying factors contributing to responding. Most importantly,

reactance is suggestive of renewed attempts to establish freedom, whereas learned helplessness is related to impaired learning and passivity. These issues led Wortman and Brehm (1975) to suggest an integration of these two theories. They proposed that if an individual expects to be able to control outcomes that have some personal significance, discovering that those outcomes are uncontrollable would lead to reactance. Accordingly, individuals exposed to helplessness training, having expectations of control, will view initial trials of this training as threatening and will experience reactance. Reactance, in turn, will initially improve performance. However, when subjects are exposed to extended trials of helplessness training, a point will be reached where their efforts are recognized as unsuccessful, and attempts to regain control will cease. Thus, according to this formulation, reactance precedes helplessness given two conditions: the importance of the outcome and the expectation of control. Research has provided support for this integrative model.

For example, Seligman and Maier (1967) hypothesized that prior experience with control would produce more reactance when animals were later exposed to helplessness training and subsequent testing. In this study, one group of dogs were given 10 escape-avoidance trials in a shuttlebox followed by 64 unsignaled and unescapable shocks the next day (shocks were inescapable because these dogs were immobilized in a harness). The second group of dogs received only the helplessness training and testing. On the third day, both groups were placed in the same shuttlebox. Results showed that the group that had received the

escape-avoidance trials made significantly more escape attempts during the inescapable training than the other group and did not exhibit helpless behavior.

The behavioral reactance demonstrated by the group that had received avoidance training suggests that these animals responded in an active and control-expectancy manner in order to avoid an uncontrollable aversive outcome.

One of the studies reported in Glass and Singer (1972) conducted by Shaban and Welling, under the direction of Jerome Singer, provides a further demonstration of the integrative model (Wortman & Brehm, 1975) and that past experience with control influences response variability to uncontrollable situations. This study was conducted in order to examine the aftereffects of perceived controllability by subjecting male college volunteers to one of two types of bureaucratic harassment. In one condition, subjects were exposed to an uncontrollable situation where they were confronted with a rigid and inflexible system (regulations responsible), while the other simulated a potentially controllable situation where a harassing bureaucrat might be persuaded to be less inflexible (personally responsible). The control manipulation took place in an office where the subjects and a no harassment control group were sent to complete a form required by departmental regulations before participating in the "experiment."

Upon their arrival at the office, the department's administrative assistant (a confederate posing as the bureaucrat) emphasized the importance of the questionnaire. Controls responded to a few simple questions and were dismissed.

Subjects in the two experimental conditions were asked to complete a questionnaire that was both lengthy and redundant with little space provided for answers. It was at this point that the two conditions diverged.

When subjects in the personally responsible condition turned in their completed questionnaire, the assistant glanced at it and immediately told the person it wasn't completed to "her satisfaction" and handed them another to fill out. When it was apparent that the subject had just finished the second form, she received a telephone call (ring activated by her) and proceeded to discuss personal matters with a friend, making it necessary for these subjects to wait until she was free to examine the form. After receiving and spending some time examining the first questionnaire from the subjects in the regulations responsible condition, the assistant showed these individuals memos emphasizing the importance of precise and complete answers, "regretfully" making it necessary for them to also complete a duplicate form. Again, as the subject was finishing, the telephone rang (similarly activated) and despite the assistant's attempts to terminate a business conversation with an obvious superior these subjects were made to wait. All participants returned to the laboratory where aftereffects were assessed by proofreading scores, performance on a variation of the Orne task (subjects were instructed to take a sheet of arithmetic problem they had just completed and tear it into no fewer than 32 pieces), and behavior during the bargaining task.

Proofreading scores reflected a general aftereffect with the harassed groups showing more deficits than controls. In addition, subjects confronted with a system

over which they had no control (regulations responsible) were found to exhibit more helpless behavior during the task sessions and were more likely to accede control to others. Subjects holding some expectations that they may have been able to influence the assistant apparently responsible for their ordeal, having attempted but failed, responded during the task sessions by trying to regain control through reactance and hostility toward the experimenter and their task partner.

Wortman and Brehm's (1975) notion that the importance of the outcome will have a significant effect on an organism's response to lack of control was tested by Krantz and colleagues (1974). In a training session subjects were exposed to either loud or moderate noise; one group could escape the noise while the other could not. In the testing situation all participants were able to terminate the noise. These data failed to reveal a significant relationship between outcome importance and response to lack of control leading Wortman and Brehm (1975) to theorize that outcome importance and the amount of helplessness training may interactively affect response to loss of control.

Roth and Kubal (1975) addressed this theory in their research. College students participated in what was described as two concept formation studies; in the first "study," high and low task importance was cross-cut by three conditions: contingent reinforcement only; low helplessness training with noncontingent reinforcement; and the third, a high helplessness condition where subjects received noncontingent feedback on three problems as opposed to the one problem presented in the other two conditions. The second study was actually a session

testing the manipulation effects and included a control group that did not participate in the training phase. During this session subjects worked on a similar pattern task. Measures of ability and persistence were the mean number of problems solved and the mean number of times a new problem was requested (respectively) during the testing session.

The results of this experiment lend considerable support to the integrative model. While the general pattern of results confirmed an interaction between outcome importance and the amount of helplessness training, it failed to reach statistical significance. As predicted, not being able to obtain the desired outcome on one problem aroused reactance and a consequent increase in motivation. Analyses indicated that participants in the high importance condition who received the least helplessness training solved significantly more problems and were more persistent than controls. In contrast, high importance subjects who received extended helplessness training performed significantly poorer than the controls.

In summary, Wortman and Brehm's (1975) integrative model of reactance and learned helplessness provides a framework for how loss of control may result initially in reactance and later in symptoms of learned helplessness. The underlying constructs of this model, expectations of control and importance, are directly proportional to the reactance and helplessness experienced. An individual not expecting to be able to control or influence an outcome will not experience reactance and will show symptoms of helplessness relatively quickly when exposed to uncontrollable situations. However, when a person expecting to be able to exert

control over an outcome of some importance learns control is not possible he or she is likely to respond by attempting to regain control. Reactant behavior will continue when expectations of control are greater and/or the outcome is very important to the individual. When it eventually becomes evident that control is impossible, he or she stops trying and begins to show symptoms of helplessness.

This overview of the stress process and the discussion of appraisal, coping, and control as mediators of stress demonstrates how the stress response is influenced by interactive cognitive factors, individual predispositions, and changing contextual demands. A stressor perceived as having personal significance to an individual's well-being may be interpreted as harmful, threatening, or challenging. Based on this initial assessment, the person engages in cognitive and/or behavioral efforts in order to reduce the aversiveness of the person-environment transaction. Reappraisals and changes in coping strategies are made in response to a continuing aversive experience and/or changes in the stress situation. Finally, perceptions of control can reduce or minimize stress appraisals, affect the appraisal process, interact with coping, and directly influence stress outcomes.

Therefore, some environmental conditions may have little or no impact on some people, while others perceive and respond to them as significant threats to their well-being. It is obvious as well that many events or conditions are inherently stressful and it will be shown that others, seemingly benign, in some circumstances can be equally or more stressful. The effects of stressors may be of relatively short

duration or long-term. In terms of the present study, the research identifying factors associated with these differences provides the basis for testing the proposed hypotheses.

Acute and chronic stressors

In order to study the effects of different stressors, investigators have either based their research on classification systems or focused on person-environmental interactions tailored to their interest in specific factors influencing the stress response (Kiritz & Moos, 1974; Lazarus & Cohen, 1977).

Lazarus and Cohen (1977) developed a three-fold typology of stressors based on the severity of the event's impact and the number of people likely to be affected. The first, cataclysmic events, are marked by their powerful and devastating nature, often occurring and subsiding quickly, but leaving in their wake numerous victims and in most cases environmental destruction. The second type of stressors are similar to the first in that they also occur suddenly, resulting in emotional and physical distress but are distinguished from the former in that they tend to affect fewer people and are more personal in nature. The third type of stressors discussed by Lazarus and Cohen (1977) are background stressors or daily hassles encompassing those bothersome events that everyone encounters and are typically thought of as no more than an annoying part of daily life.

By classifying stressors in this manner it can be seen that response to a sudden stressful event should differ from that of routine daily disruptions and that in the case of the first two classes the latter, involving fewer people, may inhibit

affiliative and social comparison behaviors that serve as coping functions to reduce the impact of a specific threat (e.g., Schachter, 1959).

Research also suggests that social environments, much like people themselves, have distinct "personalities" that can directly affect psychological and somatic health (Kiritz & Moos, 1974). In a review of this literature, Kiritz and Moos (1974) discussed how these adverse effects occur based on three dimensions of person-environmental interactions. The first dimension is the degree to which an individual is involved in his or her social environment. Here, factors such as mutual support and group cohesion have been shown to tend to reduce stress, whereas high involvement in stressful situations is associated with increases in hormonal activity. The second dimension consists of how a social environment may negatively affect personal well-being. This has been demonstrated by Miller (1968) in a study of aircraft personnel revealing that environments imposing responsibility for one's self and others have been related to physical symptoms of stress. The final dimension is the relative stability (or lack thereof) of the person-environment transaction with lack of clarity and change associated with stress-related symptoms. Kiritz and Moos (1974) also discussed how these direct effects are mediated by a person's perception of the social environment, conditions of the specific interaction, and perceptions of control.

Lazarus and Cohen's (1977) typology of stressors and the research described by Kiritz and Moos (1974) has provided a framework for investigating how variations within types of stressors and other determinants of the

person-environment relationship affect stress responses and is particularly relevant to chronic stress. These factors are equally important in studies on acute stress. The following sections will show how controlled laboratory studies on acute stress gave rise to research interest in chronic stress.

Acute stressors. Short-term stressors can result in physiological, psychological, and behavioral changes detectable during and usually briefly following an event. The prior review of the stress process and factors mediating stress response showed how appraisal of an event as stressful results in SNS activation and situation-specific coping responses which, if effective, serve to reduce stress and result in adaptation (e.g., Coyne & Lazarus, 1980; Frankenhauser et al., 1968; Speisman et al., 1964). In other instances, acute stressors were shown to tax or exceed a person's ability to successfully manage a particular situation resulting in post-experimental impaired cognitive functioning, behavioral deficits, and the increased likelihood of ill health (e.g., Cohen, 1980; Glass et al., 1980; Selye, 1976).

The literature on response to acute stressors in animals and humans is extensive, as is the research examining the mediating effects of control on stress. Therefore, this review will be limited but representative of the findings on exposure to acute stress and how controllability affects stress responding. The comprehensive investigations conducted by Glass, Singer, and colleagues (Glass & Singer, 1972) on the effects of exposure to unpredictable and uncontrollable noise as well as other social stressors demonstrated that such aversive events

resulted in post-stressor behavioral deficits. These aftereffects included reduced tolerance for frustration and deterioration in performance on tasks requiring care and attention, despite evidence of physiological adaptation during the presentation of acute stressors. These studies indicated that the aversive impact of an unpredictable stressor is partly attributable to an individual's inability to control or perceive the possibility of escape or avoidance.

Glass, Singer, and Friedman (1969) demonstrated that perceived uncontrollability and its exacerbation of stress are mechanisms mediating the effects of unpredictable noise and decrements in frustration tolerance and quality of post-noise task performance. Similar investigations supported the above data. Negative aftereffects of unpredictable noise are reduced by the perception of potential control (Cohen, 1980; Geer et al., 1970; Glass & Singer, 1972).

In summary, these studies indicate that physiological adaptation to an acute laboratory stressor is achieved within a relatively short period of time. Despite this adaptation, perceived controllability of a given stressor is an important determinant of the aftereffects of aversive stimulation. These investigations, and many others generated research interest in the generalizability of these findings to other sources of stress and how changes associated with exposure to stress are related to illness and disease development.

Chronic stressors. According to Selye's (1976) biological model, an organism mobilizes resources to combat a stressor, resists by using available resources, then, upon their depletion and/or having failed to manage the stressor,

becomes more susceptible to illness and disease. In terms of cognitive psychological theory, when individuals perceive an event as stressful and are unsuccessful in their efforts to manage its attendant demands, physical and psychological responding persists until available resources are exhausted. Exhaustion of resources paired with a still unresolved stressor lead to dysfunction associated with chronic stress. Studies of chronic stress suggest that the perceived relevance of an event is related to whether or not individuals are likely to suffer long-term consequences. Other determinants of chronic stress include the duration or consequences engendered by a stressor and the unique characteristics of an event. The way these factors may contribute to the development of chronic stress can be demonstrated by using Lazarus and Cohen's (1977) classification of stressors.

Cataclysmic events are often the result of natural phenomena such as earthquakes or hurricanes, or can be due to a mishap or breakdown of a technological system as in the case of the nuclear accident at Three Mile Island or the toxic waste leaks at Love Canal. Research suggests that the stress associated with natural and technological catastrophes differs on a number of dimensions (e.g., Lifton & Olson, 1976; Parker, 1975). In 1983, Baum, Fleming, and Davidson discussed this literature and examined how specific factors could account for variations in stress responding. Warnings issued for impending natural disasters afford a moderate degree of predictability, but nonetheless these events result in visible destruction of property, significant personal loss, and stress-related

symptomology among survivors. Data indicate that these symptoms do not persist over time suggesting that the existence of an identifiable low point where the "worst is over" and efforts of survivors are directed toward rebuilding or repairing the obvious environmental damage provide a focus for recovery, thereby reducing stress.

While sharing some these characteristics, technological disasters differ in that they are not even predictable in a general sense and in the case of toxic leakage or nuclear mishaps have no identifiable low point. The effects of these events may extend to people not directly victimized (e.g., people living near another nuclear power plant) and in the case of exposure to toxic substances that are likely to persist beyond the actual event. Chronic stress associated with exposure to technological events is further compounded by perceptions of loss of control. While natural disasters represent a lack of control over environmental elements, accidents or failures of technology designed and supposedly controlled by experts result in victims experiencing a loss of control (Davidson et al., 1982).

The death of a spouse and unemployment are both potent personal stressors characterized by sudden loss followed by a period of shock or disbelief and requiring significant personal lifestyle adjustment. Widows and widowers generally experience additional financial strain and in some instances withdraw from others who might provide social support. However, the rituals associated with death, the grieving process, and a supportive environment can reduce the likelihood of long-term health consequences and enable the majority of these individuals to

adapt to their new circumstances (Shneidman, 1980). Data on the health effects of short-term unemployment show that anticipation of and actual job loss are related to an increase in self-reported symptoms and physiological indices of stress, while re-employment is associated with significant decreases on these measures (Jackson & Warr, 1984; Kasl & Cobb, 1970).

There is, however, evidence that in some cases the demands of these personal stressors exceed a person's adaptive capabilities. A study by Young, Benjamin, and Wallis (1963) found a significant increase in the death rate among elderly widowers during the first six months of bereavement although rates beyond this period were comparable among same aged married men. Schmale and Iker (1966) were able to predict uterine cancer in 71% of a sample of women admitted to a hospital for further testing after pap smears indicated atypical cytology based on self-reported recently experienced personal loss and expressed feelings of helplessness or hopelessness during a psychiatric interview. Long-term unemployment has been shown to be associated with persistent stress-related symptoms, increased mortality, loss of control, and learned helpless behavior (e.g., Baum et al., 1986; Brenner & Mooney, 1983; Hepworth, 1980).

Lastly, there is the issue of the effects of daily hassles which Lazarus and Cohen (1977) described as routine repetitive events one encounters in daily life. Some of these bothersome hassles are merely annoying events requiring little or no adaptation. However, research has shown that this type of stressor can have

cumulative effects and that when a number of these events simultaneously occur over protracted periods they can result in health impairment (e.g., Cohen, Glass, & Singer, 1973; Singer, Lundberg, & Frankenhaeuser, 1978).

By contrasting events within the three types of stressors defined by Lazarus and Cohen (1977) it has been shown that the unique nature and perceived relevance of a given event, in part, determine whether individuals are more or less likely to develop symptoms of chronic stress. Further, it was shown that chronic stress has been found in response to a variety of environmental and social stressors some of which are prolonged or repetitive in nature and others which occur suddenly.

Chronic stress is characterized by its association with sustained physiological arousal, cognitive and behavioral impairment, increased symptom reporting, development or exacerbation of stress-related illnesses, and feelings of loss of control which often induce symptoms of learned helplessness (Baum, Gatchel, & Schaeffer, 1983; Cohen, Krantz, Evans, & Stokols, 1982; Gatchel, et al., 1982; Gibbs, 1986). In some ways, job loss and unemployment may be seen as good examples of chronic stress that often appear to be more representative of acute stressors. Research suggests that job loss and short-term unemployment are associated with initial increases in sympathetic arousal and other stress-related

problems that appear to decrease over time (Jackson & Warr, 1984; Kasl & Cobb, 1970). These findings suggest that in and of itself job loss is not a chronic stressor; rather, it is more likely that job loss followed by long-term unemployment will be associated with chronic stress.

In order to investigate how a chronic stressor, in this case long-term unemployment, influences response to acute stressors, it is first necessary to review the research suggesting that job loss followed by long-term unemployment is indeed a chronic stressor. Once this is established, data from a study will be presented showing how psychological factors associated with unemployment may influence health outcomes.

Unemployment stress

Economic decline at the societal level creates depletion of material resources necessary to maintain socioeconomic stability and psychosocial stress associated with unemployment. Individuals attempting to cope with the loss of their jobs may begin to engage in or increase health-damaging behaviors such as excessive alcohol consumption and cigarette smoking (Brenner, 1976; Cobb & Kasl, 1977). Psychological stress associated with unemployment results from the loss of social and economic position as well as self-esteem, a future fraught with uncertainty, damage to social networks, and an abrupt change in life circumstances (Brenner & Mooney, 1983).

In a 1980 review of the research examining the relationship between economic change and behavioral disorders, Dooley and Catalano suggested that aggregate studies that examine the relationship between an economy and the psychological well-being of the population it supports, conducted longitudinally (aggregate time-series research) provide a more comprehensive measure of this type of relationship. Using this approach, Dooley, Catalano, Rook, and Serxner (1989) examined variation in suicide and unemployment rates between 1975 and 1982 in Los Angeles, CA. These data show a direct relation between unemployment and suicide rates. Similarly, cardiovascular disease (CVD) mortality rates are typically found to be associated with unemployment rates as well, usually at lags between 1 and 5 years (Brenner, 1971; Brenner & Mooney, 1983). In addition, research data from U.S. studies show a direct association between unemployment rates and cirrhosis deaths related to alcohol consumption at various lags following job loss (Brenner, 1976). Although these findings are subject to the traditional limitations of correlational studies and relatively insensitive to situational and individual differences, they suggest that unemployment may have serious health-related outcomes.

In addition to health risks associated with unemployment, the past two decades have increasingly drawn public attention to another consequence of being unemployed - homelessness. This social condition is by no means new. Along with unemployment, homelessness has been studied by social scientists since the early part of this century. During the "Great Depression" hoboism and displaced families

were prominent in the social literature (Sutherland & Locke, 1936; Park & Burgess, 1967). There are, however, substantial differences between homeless people in the 1930's and those homeless and unemployed during the past twenty years.

Early in this century, particularly in urban areas, the majority of displaced persons were not completely without shelter, food, and occasional work (Shlay & Rossi, 1992). Skid rows were replete with boarding houses and inexpensive eating places. Jobs for a day in a town or city were available and migrant work was available for individuals or families able to relocate (Sutherland & Locke, 1936). In a sense, homelessness in the 1930's was defined as being without a stable place to live and raise a family (Shlay & Rossi, 1992).

World War II brought wartime jobs and social programs developed during the war and afterward marking a decline in unemployment and homelessness. The post-war 1950's brought prosperity and urban renewal as the need for transient labor decreased (Lee, 1980). The decline in the number of homeless and/or unemployed lasted well into the late 1970's.

In the 1970's, the end of the Vietnam War, lack of available rental housing, and economic instability created a more visible group of unemployed and homeless people (Elliott & Krivo, 1991; Rosenheck & Fontana, 1994). Another factor contributing to this rising population was the deinstitutionalization of psychiatric patients (Fischer & Breakey, 1986; Wright, 1988). In their review of contemporary

research on homelessness, Shlay and Rossi (1992) state that in the previous year (1991), Americans considered homelessness as one of the country's most pressing social problems.

Although none of the subjects who participated in the present dissertation research were homeless at the time of the study, some members of the unemployed groups were currently living in a shelter. During the debriefing period, after having learned that the purpose of this research was to examine loss of control associated with chronic unemployment, the majority of unemployed subjects living in a shelter and many who currently had other living arrangements, voluntarily talked about their experiences with homelessness. Some spoke about being evicted from their homes, separated from their families to search for work, and living on the streets. The subjects related that these homeless periods lasted a minimum of a few days and as long as a month, quite often interspersed with staying with family, friends, or in temporary shelters during severe weather.

This anecdotal evidence and data from this study is supported by the work of Shlay and Rossi (1992). In their review of the homeless literature, the authors used 60 studies conducted between 1981 to 1988 to analyze this research. Shlay and Rossi used each study as a data point to estimate the characteristics of the homeless. This analysis indicated that 81% of the subjects in these studies were unemployed, their mean age was 36 years old, and 74% were male. The likelihood of homelessness among the unemployed, particularly the long-term unemployed, will be addressed in the discussion section as a possible potentiating factor

influencing loss of control associated with chronic unemployment. To date, the literature appears to differentiate between these social issues addressing only homelessness or unemployment, with marginal reference to the other.

In summary, there is evidence suggesting that unemployment influences society as a whole, inflicts psychological and physical distress on the unemployed and their families, and is often associated with homelessness. The following studies are representative of the data collected from the research on the effects of unemployment stress.

Eisenberg and Lazarsfeld (1938) summarized over 100 investigations examining job loss during the "Great Depression". These studies showed that unemployment is a stressful process affecting psychological health and that the course of unemployment was characterized by shock followed by active job-seeking, then a shift toward pessimism and feelings of distress that finally resulted in fatalism and a negative attitude toward life. Conceptually, there were marked differences in stage progression in these studies, the data were usually based solely on self-report and, in some instances, analyses of edited essays. Despite these confounds their summary continues to be regarded as a critical assessment of the psychological research of that period (Fryer, 1985).

More recent periods of economic decline during the 1970's and 1980's generated a substantial literature conceptualizing the unemployment experience in terms of the stress process. Although research suggests that national policies and supportive systems may positively influence the unemployment experience,

investigations conducted in the United States and more socialistic countries (e.g., Great Britain, Sweden) clearly support the notion that being unemployed is stressful.

Jackson and Warr (1984) examined how age, length of unemployment, and employment commitment affected psychological health in a sample of British unemployed men ranging in age from 16 to 64 years with length of unemployment ranging from less than 1 month to more than 12 months. One's commitment to employment is derived from the internalization of societal values of financial success and occupational achievement (Little, 1976; Warr, 1984a). Previous studies have indicated that among the unemployed, high levels of employment commitment are related to psychological stress and symptom reporting (Jackson, Stafford, Banks, & Warr, 1983; Warr, 1983, 1984b). Despite the benefits and re-employment opportunities provided by the British government, data from this study suggest that long-term unemployment is related to persistent symptoms of psychological stress and poorer general health. Psychological stress was significantly related to length of unemployment in middle-aged men, while unrelated in younger and older subjects (Hepworth, 1980; Warr, 1984a; Warr, Banks, & Ullah, 1985). The data indicating that a higher degree of employment commitment was positively related to symptoms of psychological stress (although independent of length of unemployment in this study) and showed that these individuals perceived their unemployment as threatening rather than challenging.

These findings and other studies indicated that demographic variables (Warr & Parry, 1982), employment commitment (Jacobson, 1987; Warr, 1984a), and socioeconomic status (Kessler, Price, & Wortman, 1985; Little, 1976; Warr & Payne, 1983) influence stress responding among the unemployed. The following two studies are representative of the research conducted during the 1970's on the effects of the American manufacturing industries plant closings and provide further evidence of the consequences associated with exposure to unemployment stress.

A longitudinal study on the physiological and psychosocial consequences of job loss was undertaken by Cobb and Kasl (1977). This research was designed to follow samples of blue-collar men facing the impending shut-down of the plant where they were employed through two years following the loss of their original job. Comparable control groups of employed men participated for the same length of time. Subjects were interviewed and physiological measures were collected beginning two weeks prior to job loss through two years following job loss. Kasl and Cobb reported several preliminary findings in 1970. These analyses revealed, that when compared to controls, unemployed subjects showed marked elevations in blood pressure (BP) during the first two visits followed by a significant drop in systolic (SBP) and diastolic (DBP) readings among the 80% of subjects who had been re-employed within the first one year period. The remaining 20% of subjects, who were still unemployed, showed sustained elevations in blood pressure (particularly DBP) and reported higher levels of subjective stress and poorer personal adjustment to their circumstances. Results of the completed

investigation (Cobb & Kasl, 1977) suggested that, among these "hard-core" jobless men, the unemployment experience (despite subsequent re-employment) was related to physiological changes which could increase the likelihood of developing CHD, a higher incidence of peptic ulcers (for both subjects and their wives), and hypertension.

The health effects of long-term unemployment were also investigated by Kessler, Turner, and House (1987) by comparing samples of blue-collar men and women who were currently unemployed (CU), previously unemployed but holding jobs (PU), and an employed group. Both the CU and PU groups had been out of work for more than two years. Health outcomes were assessed by scores on three subscales of the Symptom Checklist 90 (SCL-90; Derogatis, Rickels, & Rock, 1976) and responses to a health questionnaire. It has been shown that there are significant associations between demographic variables and the outcomes that were measured in this study (Kessler et al., 1985). This potential confound was minimized by dummy coding the demographic variables. In dummy coding, numbers assigned to a variable are not associated with any relational value. Analyses revealed significant elevations in somatic and psychological stress for the CU group across all health outcomes when compared with the other two groups. Somatic symptoms were significantly higher among PU subjects compared to the employed group suggesting that the psychophysiological stress associated with job loss is not entirely removed by re-employment. The data showing that elevated symptom reporting among the unemployed was largely confined to those people

reporting increases in other stressful life events is directly relevant to the current investigation as it suggests that unemployment stress is exacerbated by other stressors.

While these data have shown that unemployment is a stressful experience and suggest that long-term joblessness is associated with symptoms of chronic stress, these studies have not addressed how psychological factors associated with the process of unemployment stress contribute to health outcomes.

Baum and colleagues (1986) bridged this gap in the literature. Their investigation examined whether loss of control associated with joblessness was related to emotional distress and physiological arousal. In addition, by manipulating control expectations and measuring causal attributions, these researchers were also able to examine whether these factors were related to task performance and duration of unemployment.

Participants included a control group of employed persons and three groups of subjects who had been unemployed for less than 3 weeks, 3 to 8 weeks, or more than 8 weeks, respectively. Subjects provided demographic data, urine samples prior to and following the session, and responded to questionnaires assessing concerns and expectations at various points during the experiment.

As previously described, expectations of controllability were manipulated by giving subjects either random noncontingent or veridical feedback on a task requiring subjects to identify one of two letters on a slide as correct based on five different parameters (Levine, 1975). Subjects were shown seven series of slides,

within each series, the "correct" parameter remained the same (for example, the smaller letter, the letter in a circle, etc.). Thus, subjects receiving noncontingent feedback were unable to solve this task, while those given veridical or contingent feedback could, by trial and error, learn the pattern and solve the task. Following this manipulation all subjects worked on selected embedded figures tasks (EFT) where performance provided a behavioral measure of persistence and helpless responding. The results of the Baum et al. (1986) study provided the framework for the current investigation. Therefore, these data will be presented at length and will be discussed in terms of their relevance to the literature on unemployment stress and this study's hypotheses.

Analyses of Baum et al.'s (1986) demographic data showed that subjects in the various conditions were comparable on these variables with the exception of employment related issues. The majority of subjects were under forty years old, with 35% married. No significant differences were found between subjects for education, length of marriage, or type of residence.

Urine samples assayed from the initial void revealed that catecholamines were higher among unemployed subjects when compared with employed controls, with higher levels paralleling increased length of unemployment. All subjects receiving veridical feedback during the Levine task showed a decrease in catecholamine levels from samples taken post session. Among subjects exposed to noncontingent feedback, employed controls and those recently unemployed

exhibited sharp increases in these hormones while those who were unemployed longer than three weeks showed decreased catecholamine levels (post session compared to initial sample).

Unemployed subjects were less persistent and less accurate than were controls when working on the EFT, and performance decrements increased with length of unemployment. Unemployed subjects in the noncontingent condition demonstrated the same response pattern revealed by the catecholamine data, with the long-term unemployed subjects showing decreasing effort and accuracy as the task continued. Analyses of questionnaire data showed that all subjects receiving veridical feedback reported that they believed their ability and effort during the Levine task and the EFT were responsible for successful performance. Among long-term unemployed subjects in the noncontingent condition, fewer self-reported attributions of internal causes of success (ability and effort) were made compared to external causes of performance (solvability and difficulty of the EFT). The trend to attribute external causes of performance mirrored length of unemployment. In fact, only subjects unemployed for longer than six weeks and who received noncontingent feedback during the Levine task, correctly identified task solvability as the operative factor determining task success.

By manipulating subjects' perceptions of success or failure on the Levine task, Baum et al. (1986) were able to show how the process of unemployment stress interacts with perceived control related to subsequent tasks. These findings suggest that loss of control associated with chronic unemployment results in

performance deficits on subsequent tasks. During the EFT, these deficits appear to be related to an increasing lack of effort and accuracy or behavior associated with helplessness. Additionally, while catecholamine data initially revealed that long-term unemployment was positively related to increased sympathetic arousal, by the end of the experimental session, this pattern was reversed.

This study (Baum et al., 1986) further revealed that exposure to noncontingent feedback resulted in a pattern consistent with Wortman and Brehm's (1975) theory that noncontingency first produces reactance, and that only after repeated unsuccessful attempts to regain control does helplessness begin to be the dominant response. Those subjects holding expectations of control exhibited sympathetic arousal, while those with weaker expectations showed less stress-related physiological arousal.

Longer-term unemployed subjects in the noncontingent condition, compared to all other subjects, were more accurate in rating task solvability as the determining factor regarding performance on both sets of tasks. This finding was discussed by Baum and colleagues who suggested the possibility that the lack of relationship between job-seeking efforts and finding re-employment as well as little if any success in managing problems associated with chronic unemployment may have heightened these subjects' sensitivity to other noncontingent conditions. While this recognition may result in adaptation to other noncontingent situations, Hiroto and Seligman's (1975) work indicated that exposure to noncontingent conditions resulted in behavioral generalization to other situations. This is precisely what

occurred in the Baum et al. (1986) study. Long-term unemployed subjects having lost control as a result of their joblessness, recognized the lack of contingency between feedback and success on the Levine task then, apparently, generalized that recognition to the EFT exhibiting maladaptive behavior by persisting less and not solving solvable tasks.

Thus, Baum and colleagues (1986) successfully demonstrated that prolonged unemployment is associated with loss of control, symptoms of chronic stress, and that the lack of contingency between responses and outcomes (uncontrollability) is instrumental in the development of the deficits associated with chronic unemployment. Prior to this study, loss of control associated with long-term unemployment had only been alluded to in previous unemployment research (e.g., inability to meet financial obligations, to find re-employment, etc.). However, its relationship to stress-related consequences of joblessness had not been directly examined. These findings strongly suggest that loss of control associated with chronic unemployment may directly influence response to subsequent stressors.

The present study was designed to extend the research conducted by Baum and colleagues (1986) by examining whether loss of control associated with long-term unemployment is related to symptoms of chronic stress, by including different measures of sympathetic arousal (heart rate and blood pressure) than urinary catecholamines. Further, the present study was designed to examine the psychological mechanisms through which loss of control associated with chronic unemployment directly influences response to subsequent acute stressors.

Research Objectives and Overview

The purpose of the present study was to determine first, if loss of control associated with chronic unemployment increased the likelihood of an acute stressor being appraised as uncontrollable, resulting in secondary appraisals of insufficient coping responses. Additionally, this research was designed specifically to determine whether the effects of this appraisal directly mediated post-stressor psychological symptomology, behavioral performance, and cardiovascular response. This work is based on research findings on the effects of control on stress and the relationships between uncontrollable outcomes and reactant or helpless behavior (Baum et al., 1986; Glass & Singer, 1972; Hiroto & Seligman, 1975; Wortman & Brehm, 1975).

In order to test the hypotheses that loss of control associated with chronic unemployment affects the appraisal processes and directly mediates post-stressor response, it is first necessary to determine whether long-term unemployment is a chronic stressor associated with perceived loss of control. Because random assignment to employed or unemployed conditions was not possible, a quasi-experimental design was used where qualified volunteers formed three groups based on their current employment status. To examine differences between stress responses among groups, all subjects were exposed to a stressor consisting of working on three different types of tasks while exposed to loud intermittent, unpredictable noise (Glass & Singer, 1972; Singer, Acri, & Schaeffer, 1990). Heart rate and blood pressure were monitored during the task portions of the laboratory

session. Half of the subjects in each group were randomly assigned to either a controllable or uncontrollable noise condition. This manipulation allowed for comparisons within and between groups and how loss of control associated with chronic stress had the direct and mediating effects that were hypothesized.

Three factors contributed to the choice of this type of noise as a stressor. First, research has shown that people physiologically adapt to noise rather quickly and task performance is not often affected during auditory stimulation (Glass & Singer, 1972). Secondly, it provided a cover story for the study, in order to minimize the possible confound that subjects may have altered their behavior if they had been aware that perceptions of control were major independent variables.

Finally, and most importantly, exposure to noise (especially unpredictable bursts) has been shown to be associated with aftereffects; the severity of which are related to the uncontrollable and unpredictable nature of the noise (Glass, et al., 1969; Singer, et al., 1990).

After exposure to either controllable or uncontrollable noise, subjects responded to an after-effects task (Embedded Figures Task, or EFT) with heart rate and blood pressure monitored during this period as previously described. Performance and persistence on the after-effects task, changes in the physiological measures, and self-reports were used to test the predicted effects of loss of control associated with chronic unemployment.

Prior to the presentation of this study's hypotheses the rationale behind limiting subjects in this study to middle-aged men with experience primarily in semi-skilled or skilled positions in order to more clearly demonstrate the proposed relationship between loss of control associated with long-term unemployment and symptoms of chronic stress.

Women have been shown to respond differently to unemployment than men, due in part to the way women internalize societal values of financial success and occupational achievement, and as a function of their personal financial responsibilities (Banks & Jackson, 1982; Warr & Parry, 1982). Potential gender differences in coping styles and perceptions of control may have further confounded the hypothesized direct relationship between loss of control associated with chronic unemployment and subsequent response to the laboratory stressor and after-effects task (Carver, Scheier, & Weintraub, 1989; Folkman & Lazarus, 1980; MacNair & Elliott, 1992). These and other issues would have needed to be addressed and/or controlled for, making this project more complex.

Studies have also suggested that a curvilinear relationship exists between age and unemployment stress in males, with middle-aged men showing greater stress-related symptoms than younger and older unemployed men (Hepworth, 1980, Jackson & Warr, 1984). Warr (1984a) posited that this relationship is both a function of age and an individual difference variable that changes as role responsibilities vary during the life-cycle.

Additionally, it has been suggested that occupational status influences response to unemployment (Hepworth, 1980; Jacobson, 1987). Intuitively, individuals possessing technical skills, higher levels of education, and more financial assets would tend to find unemployment less stressful than those with insufficient resources (i.e., less financial strain, more likelihood of finding re-employment, etc.). Further, the majority of evidence suggesting unemployment is stressful is based on samples of jobless blue-collar workers. Other factors that are possibly related to either the impact of unemployment or the independent measures will be considered in detail in the Methods section.

Hypotheses

Although responses to job loss and unemployment have been studied extensively, there is sufficient evidence showing that some individuals develop stress-related symptoms while others are seemingly unaffected. Data have shown as well that unemployment stress is related to varying degrees of psychological distress and ill health. These findings suggest that unemployment stress is similar to other stressors and may be used as a specific exemplar to investigate how specific psychological factors mediate the stress process.

Inability to control stressors has been defined in terms of perceived noncontingency and its potential negative effects on appraisal of coping resources (Gatchel, 1980; Thompson, 1981). A derivation of this definition is that perceived loss of control may occur as a consequence of learning that a given stressful event cannot be avoided, ignored, or changed by cognitive or behavioral strategies. If

such a stressor has a significant impact on a person's well-being, this noncontingent learning may adversely affect the appraisal of other stressors. In that noncontingent learning results in symptoms of helplessness has been shown to generalize to other stressful situations (Baum et al., 1986; Hiroto & Seligman, 1975), it is possible that loss of control associated with chronic unemployment directly mediates helpless responding to subsequent stressors. Further, if loss of control associated with an on-going stressor negatively affects appraisal processes, it is also possible that this interaction will similarly affect appraisals of subsequent stressors.

It is predicted that:

1. Subjects who have been unemployed for longer than two months (long-term unemployed) will report more physical and psychological symptoms related to chronic stress, including higher baseline heart rate and blood pressure readings when compared to the other two groups.
2. Perceived loss of control associated with chronic unemployment will generalize to the laboratory situation resulting in long-term unemployed subjects appraising the noise and task portion of the session as more threatening and uncontrollable than either the short-term unemployed or employed subjects.

3. The proposed relationship between loss of control associated with chronic unemployment and appraisals of the stressor and the aftereffects task will result in the long-term unemployed subjects in the uncontrollable noise condition demonstrating more helpless behavior, specifically a greater inability to concentrate or persist on the EFT items.
4. Short-term unemployed subjects in the uncontrollable noise condition will evaluate the stressor and EFT as more uncontrollable than their counterparts and employed subjects in both noise conditions. As a result of having no control over the noise, these subjects will actively attempt to regain control during the EFT. These attempts to regain control, or reactance, will result in this group persisting longer on the EFT items than any other subjects.
5. Employed subjects having no control during the noise and tasks stressor will respond to the inability to control the stressor through reactance while working on the EFT items. These subjects will persist longer than employed subjects in the perceived control condition. In turn, employed subjects having perceived control over the stressor will appraise the EFT as simply another task. They are unlikely to report control problems or display helpless or reactant behavior. Persistence on the EFT will be attenuated compared to employed subjects in the uncontrollable noise condition.

6. Performance on the EFT will be positively affected by reactance, negatively affected by loss of control, and not affected if perceived as simply another laboratory task.
7. Among long-term unemployed subjects, cardiovascular response will show a more pronounced return to baseline compared to the other groups. Given that short-term unemployed (no control) subjects will be actively engaged in attempts to assert control, it is expected that sympathetic arousal, as measured by cardiovascular response, will remain elevated while they are working on the post-stressor tasks. Short-term (perceived control) subjects cardiovascular response during the EFT is unlikely to substantially vary from baseline. Among the employed (no control) subjects, reactance will result in sympathetic arousal; therefore, it is expected that cardiovascular response during the EFT will remain elevated but to a lesser degree than short-term subjects in the uncontrollable condition.

Methods

Subjects

A total of 100 men were screened for participation in this study that was described as a research project designed to study how noise affects work performance. Criteria for inclusion in the study were as follows: no current affiliation with the University; no history of diagnosed physical conditions, emotional illness, or currently taking medication known to affect cardiovascular measures; being employed in a full-time position for at least one year, with no anticipated job change within the coming year; or, currently unemployed for less than 2 years with at least one year's work experience and actively seeking employment (See Subject Screening Form, Appendix C).

During the course of the study, it became impossible to find a sufficient number of non-smoking unemployed men between 30 and 50 years of age. Further, potential subjects were refusing to participate in a three to three and one half hour session for \$30.00. Consequently, the age range was decrease to include men in their twenties, 12 smokers were included in the study, and payment was increased to \$50.00. An analysis of variance showed no significant differences between smokers and non smokers on baseline cardiovascular measures. In addition, there were no effects found due to smoking status or payment differences on the aftereffects measures.

The potential confound that employed subjects might be experiencing substantial job-related stress was tested using scores on an abbreviated version of the job stress questionnaire developed by House, McMichael, Wells, Kaplan, and Landerman (1979) with no significant levels of work stress found among men in this group.

Thirteen of the 100 respondents failed to meet the criteria for inclusion during the screening process. Four of these men were disqualified because they were either employed by, or students of, the University, and four were under 20 years old. The remaining five were disqualified because of medical conditions (hypertension, in treatment for psychological disorders, and, or taking medication known to influence blood pressure and heart rate).

Recruitment. Men who had previously volunteered for research projects conducted by the Department of Medical and Clinical Psychology were contacted. Members of this subject pool represent nearly one half of this study's participants, primarily employed and approximately one third of the long-term unemployed subjects.

Approximately one fourth of the subject sample (predominately employed) responded to an advertisement in a local county newspaper. Recruiting was also conducted at the center for unemployment registration and job placement service for Montgomery County, MD. Although this method was extremely unsuccessful, one of the three participants screened at this site was a member of a local private

club whose members were primarily unemployed. Advertisements placed on the club bulletin board and subject referrals were the most successful recruitment strategies for both unemployed groups.

Those respondents eligible for participation were given a brief description of the laboratory session, an appointment was scheduled, and instructions concerning the location of the University were mailed to the subjects. Confirmation calls were made appropriately by the experimenter. Appointment times were counter-balanced by condition as accurately as possible to reduce the likelihood that diurnal variations in blood pressure and heart rate would substantially affect these measures.

Qualified respondents, between 20 and 49 years of age formed three groups defined by job status at session time: 24 individuals unemployed for less than 2 months (short-term unemployed); 24 men unemployed for longer than 2 months (long-term unemployed); and, 36 currently employed subjects. The division of unemployed subjects was based on the data from the study by Baum and colleagues (1986) showing that subjects unemployed two months or longer evidenced symptoms of chronic stress (See Figure 1).

Members of these three groups were randomly assigned to one of two noise conditions. Half the subjects in each group were exposed to uncontrollable, loud, intermittent noise. Prior to exposure to the same noise, the other subjects were told that they could terminate the noise for the remainder of the session by pressing a button. The button and its function were casually introduced by the experimenter as she prepared to leave the room to operate "the equipment" and was taken

verbatim from the Glass and Singer (1972) text. The latter condition was designed to induce perceived control only, thus while these subjects were given the choice of pressing the button, the experimenter encouraged them against taking that action. The six cells in this 2 X 3 factorial design were proportionally equal across perceived control and no control conditions.

During the course of the study, the session was discontinued three times; twice at the request of the subjects and once by the experimenter. These subjects were paid, debriefed, and replaced by other qualified respondents.

Measures

Stress was indexed by: levels of cardiovascular arousal, specifically heart rate (HR) and blood pressure (BP); self-reported somatic and psychological symptoms; and, measures of performance and persistence on 16 solvable items of the Embedded Figures Task (EFT) similar to those used by Witkin, Goodenough, and Oltman (1979). Appraisals of the combined noise and tasks stressor as well as the EFT items, coping, social support, job satisfaction (among the employed group), and perceptions of control were assessed using self-report measures. Potential differences in recent life events and issues related to unemployment were measured by a modified version of the Social Readjustment Rating Scale (Holmes & Rahe, 1967). Helpless and reactant behavior was measured by self-reported actual and projected effort on the modified EFT items and by the experimenter who recorded verbal and physical behaviors as subjects worked on the EFT items.

Physiological measures. The increased secretion of epinephrine and norepinephrine during sympathetic arousal associated with the stress response,

directly increases heart rate, arterial pressure, and force of contraction as blood is pumped out of the heart (Gatchel & Baum, 1963). Heart rate and blood pressure measures have been used extensively as an index of sympathetic arousal associated with stress (Baum, Gatchel, & Schaeffer, 1983; Cohen, Evans, Stokols, & Krantz, 1986; Krantz, Grunberg, & Baum, 1985).

Cardiovascular measures were taken using a Critikon Dinamap 1846 SX/P (version 091) monitor that was set to record readings at 2 minute intervals. Readings were copied from the printout to a record sheet to facilitate data entry. The monitor cuff was placed on the subject's non-dominant arm as soon as he was seated in the laboratory, allowing participants to become accustomed to working on questionnaires and the tasks with the cuff in place. Three BP and HR measures were taken after a 15 minute rest period. The mean of these readings was used as the physiological baseline measure in the analyses. Measures of BP and HR were also automatically taken and recorded at 2 minute intervals while subjects worked on tasks during the noise portion of the session and during the EFT administration. Prior to debriefing and payment, another series of three resting readings were taken and averaged providing a post-experimental measure of physiological arousal.

Self-report measures. Questionnaires were used to obtain basic demographic and socioeconomic information and to ask the subjects about somatic and psychological symptoms that they were currently experiencing or had happened to them during the past two years. Perceptions of control in general and as related to the laboratory session, desire for control, social support, appraisal of the laboratory tasks and coping were assessed in a similar manner. Each of these

questionnaires are described here in detail and appear in Appendix B. Half of the self-report measures were administered before subjects were exposed to the stressor (noise and tasks) and worked on the EFT items. The remaining questionnaires were completed immediately after the three BP and HR recovery readings were obtained.

First, subjects were asked to complete the two year version of the Social Readjustment Rating Scale (Holmes & Rahe, 1967) made up of 55 items pertaining to health, work, home situations, marriage and personal or social changes that may have happened to participants during the past two years. To test this instrument's reliability, Holmes and Rahe (1967) administered the Social Readjustment Rating Scale (SRRS) to 16 diverse groups and their counterparts (e.g., male vs. female, different age groups, race, and religion). Analysis yielded coefficient alphas all over $+ .90$, with the exception of the white vs. black pairing that was $+ .82$, attest to this instrument's reliability (Holmes & Rahe, 1967). The validity of the SRRS was indirectly addressed by the authors in that the life events listed are both associated with adaptation or coping and that the significance of these events appeared to be of equal importance to all members of the groups represented in that study (Holmes & Rahe, 1967).

The subjects were instructed to check all changes that had happened to them, then return to those items and rate the degree of adjustment each required using a scale from 1 to 100. This survey was included to assess potential differences between groups on actual number of changes and their severity as well as to measure whether subjects perceived these changes as related to their

employment status. The former was used as a comparison measure to rule out the possibility that the groups differed significantly on other recent sources of stress in their lives. The latter was assessed by responses to a duplicate questionnaire asking subjects to rate (using a 5-point Likert scale) how much the changes in their health, home situation, marriage and personal or social lives were due to their employment status (See Life Changes Supplement Form, Appendix B).

The SRRS (Holmes & Rahe, 1967) has been used in a number of studies investigating the effects of chronic stress as a way to assess any potential differences between experimental subjects and controls on extraneous sources of stress (e.g., Davidson, O'Keeffe, Weiss, & Baum, 1990; Davidson et al., 1991). Redesign costs and changing scoring procedures made it more practical to use the survey with work-related items intact, although some were not relevant to the unemployed groups. Further, it was necessary to ascertain if the employed subjects had experienced any work-related changes for two reasons. The first is that if these items were omitted, then a valid test of comparability between groups on number and severity of events could not be made. Second, if the screening process for job-related problems was not successful, then these items would detect job-related stress among these subjects. If this had been the case, then this potential confound could be controlled for by excluding these subjects from analyses and recruiting replacements.

Next, subjects completed a one page series of statements presented in a Likert-type agree/disagree format. Six of the 11 items were from the social support scale developed by Cohen, Mermelstein, Kamarck, and Hoberman (1984) with the

remaining five developed and used by Baum et al. (1986) to assess general feelings of control. This questionnaire has been used extensively by Baum and colleagues as a measure of these variables in their longitudinal investigation of the response by near-by residents to the Three Mile Island nuclear disaster (e.g., Baum, Fleming, & Singer, 1983; Baum, Gatchel, & Schaeffer, 1983; Davidson, O'Keeffe, Weiss, & Baum, 1990).

Psychophysiological distress was assessed by administering The Symptom Checklist-90-R (SCL-90-R; Derogatis, 1977). The SCL-90-R is an inventory of somatic and psychological symptoms people may have experienced as bothersome that yields three major indices of distress and can be scored on subscales providing nine specific indices of physical and psychological disturbances such as depression and somatic symptoms. Reliability of this instrument was established by testing the homogeneity with which the items on the SCL-90-R represent the underlying symptom constructs using a sample of symptomatic volunteers (N=219). Stability over time (one week interval, test-retest) was tested using a sample of heterogeneous psychiatric outpatients (N=94) yielding average coefficients on the nine subscales in the mid .80's. Derogatis (1977) reported finding high correlations with similar measures and dimensions, seven studies in which the SCL-90-R was used to test its clinical discriminative nature and construct validity by factor analyzing the dimensional structure using the principal components method.

A version of The Ways of Coping Scale developed by Folkman and Lazarus (1980) was administered twice during the session. The unemployed groups were asked to think about their job loss and unemployment status while the employed

group was instructed to select and think about a stressful event that had happened to them during the past year while answering the items on this questionnaire.

This particular version of the scale is divided into two parts, the first being a 42-item list of cognitive and behavioral strategies people may use to respond to different kinds of stressful events. Instructions for the second section ask the subjects to rate 14 statements on an agree or disagree basis (5-point Likert scale) in response to the question "In general, the stressor that I have listed above is one that...". When scored, this inventory differentiates between problem- and emotion-focused coping strategies.

Denial and emotionally-based reappraisal strategies have been shown to differentially influence response to chronic stress (e.g., Collins et al., 1983; Mullin & Suls, 1982). As previously discussed, Collins and colleagues (1983) found that endorsement of the item "I refuse to believe what is happening" (denial) and "I concentrated on something good that could come from this" (reappraisal) taken from the Ways of Coping Scale (Folkman & Lazarus, 1980) was sufficient to differentiate between subjects using either denial or reappraisal. The two items were separately used to measure these strategies in this study. The second section on the coping scale provided additional data on response to unemployment among the two groups.

The Desirability of Control Scale (Burger & Cooper, 1979) was used to measure individual differences in the motivation to control the events in one's life. Burger and Cooper (1979) employed the Kuder-Richardson 20 reliability coefficient in item analysis with the final reliability test of the 20 items yielding an $r = +.80$;

test-retest reliability was conducted resulting in a $+0.75$ reliability coefficient. Burger and Cooper (1979) tested discriminant validity by comparing their scale with the Internal-External Locus of Control Scale (Rotter, 1966); a low negative relationship was found between these two questionnaires ($r = -0.19$). Construct validity was addressed by these authors by experimentally showing that people high on this scale are also high on the illusion of control phenomena and are more susceptible to helplessness (Burger & Cooper, 1979). The subjects in this study were asked to indicate (7-point Likert scale) the degree to which they believed each of 32 statements on the Desirability for Control Scale applied to them.

Finally, prior to the noise and task stressor, subjects responded to a questionnaire developed for this study, specifically to measure loss of control associated with unemployment, while at the same time, lending credence to the cover story that this study was intended to test the effects of noise on work performance (See Job Opportunities & Working Conditions questionnaire, Appendix B). This questionnaire was developed by the experimenter and initially consisted of 100 questions representing four categories: direct loss of control, indirect loss of control, environmental fillers, and general filler items. The statements in this questionnaire were written by the experimenter. The fillers items addressed common concerns about aversive environmental work conditions while the general items were intended to elicit agreement or disagree with statements regarding events that occur in the workplace. Loss of control questions were written to reflect

how an individual might feel in an uncontrollable situation. After eliminating redundant questions and inappropriate items, the final questionnaire included six items in each of the four categories.

Items measuring appraisal taken from a questionnaire piloted by Lester (1992) were administered prior to the noise stressor and inserted in the first questionnaire on the EFT Form A.

After the post-stressor readings of blood pressure and heart rate were obtained, subjects completed the remaining self-report measures. Subjects were asked to provide basic demographic data and socioeconomic status so comparability across groups could be assessed (employment status and related variables were addressed in separate analyses). Questions were presented in a multiple-choice format for variables such as education level and location of residence. Subjects also responded to open-ended questions concerning sources of income, type of occupational background, and variables related to employment status (See Background Questionnaire, Appendix B).

In addition, employed subjects were asked to complete a Job Satisfaction Questionnaire (House, et al., 1979). This questionnaire was developed as one of the measures of a study assessing the physical and emotional health of blue-collar laborers working in a large tire, rubber, plastics, and chemicals manufacturing plant. House and colleagues (1979) derived this measure from earlier work and reported that reliabilities of each of the twelve indices on this instrument averaged coefficient alphas of $+ .73$. The authors (House, et al., 1979) reported that the face, convergent, and discriminative validity were satisfactory after discussing the

correlations with similar measures and intercorrelations between the indices. The purpose of administering this questionnaire in the current study was to assess how employed subjects perceived their current work position and if satisfaction or dissatisfaction among these subjects was a factor influencing response to the stressor and the EFT items.

The second administration of the Ways of Coping questionnaire occurred after the participants had completed the above questionnaires; this time all subjects were told to focus on thoughts that had occurred to them and the behaviors they had engaged in during the laboratory session.

Noise and tasks stressor

Intermittent noise bursts were delivered under free-field conditions at 107 dbA in a sound-attenuating chamber. The auditory stimulation used was the complex superimposed signals described by Glass, Singer, and Friedman (1969) and was similar to that used by Acri, Singer, Baum, and Weiss (1989). The bursts ranged from 5 to 24 seconds, with an average of 14 seconds, delivering approximately 1 burst per minute throughout the 26 minute task and noise period (Singer et al., 1990).

The original reel-to-reel tape, consisting of continuous noise, was recorded into cassette format. A relay system was used, whereby an activator tripped the continuous noise tape, permitting only the desired intermittent bursts to be heard. Stereo speakers were placed in the sound chamber and wired to a Yamaha Stereo Amplifier (Model AX9004). The amplifier in turn was wired to a Yamaha Double Cassette Deck (Model KX-W952). A Lafayette Instrument Company Voice Activator

(Model 18010) was wired to the cassette deck and a relay box created by the University's maintenance engineers. The signal tape was placed in deck A, with input wired to the voice activator with the continuous noise tape placed in deck B.

The noise and tasks stressor portion of the session lasted for 30 minutes. Subjects were exposed to two equal 13 minute periods of intermittent noise. The remaining four minutes were used to make the necessary equipment changes. During exposure to the noise, subjects were instructed to work on three different types of tasks (number comparisons, arithmetic problems, and cube comparisons) on slides shown to them using a caramate projector. The tasks were randomized and presented at a preset rate of one slide every seven seconds.

Subjects were given an answer booklet (See Cognitive Task Response Booklet, Appendix B), asked to read the instructions, then the experimenter reviewed the instructions while showing the subjects an example slide of each task. If a subject wrote or circled an incorrect response, the experimenter rephrased the instructions until it was apparent the subject understood how to solve the tasks. After showing the subjects the example slides, the experimenter emphasized that these items would be graded, reminded the subject to work from left to right on the arithmetic problems, and the necessity for speed and accuracy. At this time, subjects randomly assigned to the no control condition were reminded that BP and HR would be monitored frequently as the experimenter left the chamber to operate the equipment in the control room.

Subjects in the perceived control condition were also reminded about the BP and HR monitoring as the experimenter prepared to leave the room; however, after

a brief pause the experimenter turned back and pointed to a small box with a button on it that was obviously wired, and located next to the caramate within the subject's reach. The experimenter stated, "This button here controls the noise. That is, if the button is pushed, the noise will be terminated for the remainder of the session. Some of the people who have participated in this study have pushed the button, others haven't. Whether or not you use the button is up to you. Of course, we'd prefer you don't, but again it's your choice." At that point, the experimenter left the room.

Although the perceived control subjects were encouraged not to press the button, the presence of this type of device has been shown to be sufficient to induce perceptions of control (Glass & Singer, 1972; Krantz et al., 1974; Reim, Glass, & Singer, 1971). Subjects assigned to the no control condition were not given any impression they were capable of stopping the noise. If no control subjects inquired about the device, they were told that the experimenter was sharing the sound chamber with another researcher and the box along with other equipment was for another study. Before the experimenter left the chamber, all subjects were told that the experimenter would be back half way through the noise and task period to change the slides.

Thus, all subjects in this study were exposed to the same unpredictable stimulation during the stressor but varied on the amount of control (or lack of) they perceived related both to their noise condition assignment and employment status.

Aftereffects task

The EFT used in this study consisted of sixteen complex figures each of which contained a simple target figure that the subject was instructed to locate and outline. Five potential target figures were displayed at the top of each task sheet and labeled A, B, C, D, and E. Subjects were given the impression that it was possible that not all of the EFT items were solvable although all were solvable. This task has been used in numerous studies and has been shown to be a reliable measure of persistence and performance (e.g., Baum et al., 1986; Davidson et al., 1982; Wilkin et al., 1979).

Subjects were given a form entitled "Embedded Figures Task -Form A" (see Appendix B) that contained the following: the appraisal questionnaire, the questions used by Baum and colleagues (1986) inserted before and immediately after the practice item and another set inserted after every three task items; one practice item, its solution, and the sixteen tasks. The first four items preceding the practice item dealt with what information the item would provide, what type of information the subjects wanted, how well they expected to do, and how well they believed the experimenter expected them to do. The five self-report items appearing immediately after the practice item asked the subjects about what would affect their success on the EFT, how confident they believed their judgment was in answering the preceding question, how much they cared about doing well, how important it was to them to do well, and whether or not the EFT would tell them something about themselves as a person. The set of questions inserted after every three tasks was identical. The seven questions addressed: how hard the subjects

were trying to solve the "puzzles"; what the most important thing they had learned from the previous items; the next most important thing they had learned from the previous items; how well the experimenter believed they should do on the EFT; the most important reason for their performance so far; how hard they planned to work on the next items; and, how important it was to them to do well on these tasks.

Procedures

Subjects were scheduled individually. The actual length of the session varied between two and a half to three and a half hours depending on how much time a subject spent on the questionnaires. Subjects were met at the Security Office for their scheduled appointment and escorted to the laboratory by the experimenter.

When the subject was seated in the laboratory, the procedures were briefly reviewed verbally with the subject, informed consent was obtained, then the monitor cuff was placed on subject's non-dominant arm. Subjects were left by themselves in the chamber and encouraged to relax as much as possible for 15 minutes, after which three consecutive HR and BP measures were taken at two minute intervals, the experimenter then re-entered the chamber. Instructions for all questionnaires were verbally reviewed and the subjects were reminded to read the instructions before beginning each questionnaire.

Following completion of the first six self-report measures, subjects were offered the opportunity to use the restroom before the remaining portion of the session began.

The noise stressor was described as follows, "The intermittent noise you'll be hearing while you're working on the tasks will be played through the speakers next to you. The noise you'll be hearing has previously been tested in other studies and will not damage your hearing. The recorded sounds are aperiodic. That is, the noise won't be constant or have any pattern to it." Subjects were reminded that their BP and HR would be monitored during the noise and task period and to move as little as possible. Subjects were then given a booklet titled "Cognitive Task Response Booklet" containing instructions for solving the tasks, an area at the top of the third page labeled "Example Tasks" with space to answer the three examples presented by the experimenter and 154 response lines with the words "same" and "different" preceding each line. The instructions described each of the tasks and required responses as follows: a pair of multi-digit numbers requiring the subject to circle the word "same" or "different"; writing the answers to eight math problems (addition, subtraction, or multiplication) on the correct item line; and discerning, then choosing, whether a pair of cubes with symbols or letters on three sides were the "same," "different," or impossible to determine (subjects were instructed to write "NA" on the appropriate line for the latter).

After the subject had read the task instructions, the experimenter showed him the three example slides, restating the instructions, making sure that he understood the tasks and was able to arrive at the correct solutions for these examples.

At this point, the experimenter either left the sound chamber admonishing the no control subjects to remain as still as possible; or prior to leaving, told the perceived control subjects about the button in a practiced, casual manner.

Immediately after entering the control room, the experimenter first switched the BP and HR monitor from stand-by to record measures at 2 minute intervals with one HR and BP reading taken before activating the noise system and caramate. During this reading, the amplifier was activated (pre-set to the correct sound level), and the voice activator switched to the on position. Once the first BP and HR readings appeared, a stopwatch pre-set for 26 minutes was started, both cassettes were simultaneously started, and the control switch for the caramate was set to the 7 second interval. The number of tasks necessary to fill the 26 minutes required that two slide carousels be used. During the time the experimenter returned to the sound chamber to change carousels, the noise was turned off, and subjects had been informed that no interaction with the experimenter was permitted during this time.

While the subjects were being exposed to the noise and working on the tasks, the experimenter monitored the caramate to insure it was working properly and recorded BP and HR readings from the print-out to the previously mentioned record sheet. The slide numbered "69" marked the end of the first tray of slides. At that point, the carousel's remote control was turned to zero, the tapes were stopped, and the experimenter left the control room. Upon entering the sound chamber, the experimenter stated that this was the second half of the noise and task period, switched slide trays, and told the subject to begin working on line 77 when the first slide appeared. Re-entering the control room, the experimenter again changed the caramate's remote control to the preset mark and pushed both play buttons on the tape deck. Slide "38" marked the end of the second tray of slides.

The experimenter turned all noise equipment off, placed the BP and HR monitor on stand-by, and re-entered the sound chamber and asked the subject to return the task booklet. After the subject had been offered some water and the caramate had been turned off, the experimenter sat down and told the subject he would now be working on some different types of tasks, without the noise.

The experimenter handed the subject the form labeled Embedded Figures Task - Form A, specifically describing the form in the following manner. "This form contains several questionnaires, a practice task, the solution to this practice item, and the sixteen complex figures you'll be working on. For each figure, including the practice item, you'll find five possible target figures above the task labeled A, B, C, D, or E. When one of the target figures is embedded in the pattern, it will appear exactly the same way it does above. When you think you know which one it is, use your marker to outline the simpler pattern in the more complex one and circle the correct letter below the complex figure that identifies the simple design. It's important for you to remember to both outline the target design and circle the letter. If you don't do both, your answer to that problem will be marked wrong. Now, there are two other possible responses to the test tasks. It is possible that none of the five target figures appears in the more complex pattern. If you decide that this is the case, then please draw a large 'X' through the complex pattern. The other possible response is drawing a '0' through the complex pattern. Early during the task period, you may find yourself spending too much time on one of the items. Since speed and accuracy are important, you may decide to quit working on an item. Drawing a '0' through the pattern will mean that you have chosen to skip that

task and go on to the others. When you start working on the test figures and have outlined and circled your answer, or placed an 'X' or '0' over the pattern, you can not change it or that task will be graded as incorrect. In addition, you must work on each figure in the order they are presented." The subject was then given the opportunity to ask questions.

After responding to questions, if any, the experimenter instructed the subject to complete the first two pages of questionnaires, then the individual was given up to five minutes to work on the practice item. After the experimenter had reviewed the correct solution to the practice item and the subject had responded to the questions on the following page, he was told to wait until the experimenter returned from the control room (to switch the BP and HR monitor from stand-by to automatic) to begin the tasks.

Once the experimenter returned to the sound chamber, the subject was again given the opportunity to ask any procedural questions, reminded about BP and HR monitoring, and the need for speed and accuracy on the tasks. While the subject worked on the 16 EFT items and responded to the inserted questions, the experimenter recorded the amount of time spent on each item and questionnaire, while recording the subject's posturing, comments, or other behaviors.

Subjects were given a total of 20 minutes to work on the EFT items and questions. If a subject was finished in less than the allotted time, then the experimenter asked him to return the task booklet. If 20 minutes had elapsed and the subject was still working, then the experimenter instructed him to draw a line across the page at the bottom of the figure or last question he had answered and

return the form to the experimenter. At this point, the monitor was placed on stand-by, and the subject was again asked to relax for 15 minutes before the experimenter obtained the three recovery readings. After the final BP and HR readings, the monitor cuff was removed and subjects completed the remaining questionnaires described in the previous section.

Before debriefing, the subject was given a final questionnaire (See Debriefing Questions and Comments, Appendix B) that was used to check the success of the manipulations, the cover story, and if the "control" button was perceived as such. Additionally, the subject was asked whether he believed the noise interfered with his performance on the three tasks and was given the opportunity to list any questions he might have had regarding the study. During the time the subject was answering these questions, the experimenter left the sound chamber and remained in the control room until the subject appeared to be finished.

During the debriefing period, participants were informed that essentially this was partly a replication of earlier "noise and task" research that had been conducted over the past thirty years. The concept of aftereffects was explained, then the purpose of the study was described as research investigating how the effects of loss of control related to chronic stress may generalize to other stressful situations. Questions were addressed by the experimenter, then the subject was asked to read and sign the debriefing form (See Appendix C). Subjects completed the session by signing a cash voucher and were paid and thanked for their time and interest, then escorted back to the security area.

Summary of data analyses

The hypotheses in this study concerned: (1) emotional and cardiovascular responses to long-term unemployment; (2) how perceived loss of control associated with chronic unemployment would generalize to acute laboratory stressors; and, (3) how perceived loss of control associated with long-term unemployment would directly adversely affect the appraisal of, and coping with the laboratory tasks. The data analyses were designed to test these hypotheses and the possible interaction between loss of control associated with chronic unemployment in subjects assigned to an uncontrollable laboratory stressor. In addition, the analyses were designed to account for possible individual differences between subjects.

Self-reported psychophysiological symptoms, baseline cardiovascular measures, and responses to self-report measures administered prior to assignment to either the no control or perceived control conditions were entered as dependent variables in a one-way analysis of variance (ANOVA) in order to discern differences between the three subject groups (employed, short-term unemployed, and long-term unemployed).

Cardiovascular measures taken during the session and post-stressor cardiovascular measures were entered as dependent variables in a two-way ANOVA to examine differences between groups by control conditions and to test for possible interactions. Similarly, performance and persistence on the after-effects task were analyzed using a separate two-way ANOVA. The scores from questionnaires administered after the control manipulation were dependent variables in separate two-way ANOVAs to again, discern differences between

groups by control condition and to test for possible interactions. Appraisals of both the stressor and after-effects task, as well as coping with the laboratory session were dependent variables in separate two-way ANOVAs.

Demographic and socioeconomic data was analyzed using the chi square test to examine differences between groups and interactions between control conditions and groups. Data that did not reach significance were cross-tabulated for percentages or means that were examined for possible trends.

Results

Comparability of experimental groups

Comparative analyses between subjects and men who did not participate were not possible. Forty nine men were approached in addition to those who were screened for this study. These men were either not interested; or concerned that participation might result in a change in their unemployment benefits; and, refused to provide demographic information for analysis.

The mean age for all subjects was approximately 35 years old ($M = 34.5$, $SD = 6.6$). Measures of height and weight were comparable across groups. There were no significant differences in the ethnic background of participants.

Chi square analysis of groups by marital status showed that the three groups differed significantly with more employed men single or married and fewer than expected divorced. Among the short-term unemployed, fewer subjects were married and more were divorced or separated than expected. More long-term unemployed participants described themselves as single, with fewer than expected reporting being either married or separated/divorced (see Table 1).

Thirty eight percent of all participants reported that they never or rarely exercised. Among those who reported exercising on a regular basis, the majority of men in all groups (36%) did so between one to three times a week. The remaining 26% exercised either every, or every other day. Sixty eight percent of

these men endorsed aerobic exercise (walking or running) regularly. Thirty percent indicated that they included both aerobic and weight training in their exercise routine.

Socioeconomic differences between groups.

Analysis showed differences between the three groups on educational background, $\chi^2(2, N = 84) = 15.76, p < .05$. Interestingly, there were no significant differences between the employed and long-term unemployed subjects on educational level with both groups averaging at least an Associate's Degree. Only seven of all participants had not finished high school or received a GED diploma. Eight of the short-term subjects had completed high school or its equivalent, while the remaining men in this group reported having either some technical training or college experience (see Table 2).

Analysis showed that long-term unemployed subjects had held significantly fewer professional or skilled positions compared to the employed group, $\chi^2(4, N = 84) = 6.62, p < .05$ with no significant differences between the short-term group and the employed subjects. Across all groups, half of the participants currently or had worked in a skilled position. The remaining employed men were either working in a semi-skilled position or as professionals. Fifty eight percent of the long-term unemployed participants had held skilled positions, 21% had been employed in semi-skilled jobs, while 21% of these men reporting having held a professional position (see Table 3).

As expected, analysis of residential type by employment status showed that more short-term unemployed men lived either in a group home or shelters. Long-term unemployed subjects were more similar in type of residence to the employed men, living either in townhomes or single family dwellings.

Employed participants were more likely to have lived longer at their current residences than either the unemployed groups, $\chi^2(2, N = 84) = 14.38, p < .05$, and to own homes when compared to short-term subjects.

As anticipated, mean ranges revealed differences in annual personal and household incomes, with 30% of the men in the employed group relying on full-time or part-time jobs. The remaining 70% reported a variety of combined incomes that included their spouses' full or part-time jobs, income from investments, and other family members' income. Sources of income among the unemployed subjects did not differ. Twenty five percent of the men in these groups reported no income at all while 16% worked at odd jobs (usually for several hours, or fewer than two days a week). Sixteen percent of the unemployed subjects indicated that they depended on their spouse's or other family member's income (usually parents). The remaining 43% were receiving unemployment benefits or other forms of government financial assistance.

Cardiovascular Data

The mean of three resting baseline and post-stressor measures of systolic and diastolic blood pressure (SBP,DBP) and heart rate (HR) were taken at two minute intervals. While there were no differences between groups on baseline DBP or HR, long-term unemployed subjects showed a significantly higher SBP

mean than the employed group $F(2, 81) = 3.42, p < .05$. The short-term unemployed subjects showed a slightly lower mean than the employed group (see Figure 2).

During the noise and task stressor, BP and HR readings were taken every 2 minutes. A repeated measures ANOVA yielded no significant differences between groups on the three cardiovascular measures (SBP, DBP, and HR). Therefore, the 12 readings obtained during this time period were averaged, and were examined using two-way ANOVAs. Although no main effects or interactions were found for SBP or DBP during the noise and task stressor, a two-way ANOVA (perceived control vs. no control) showed that the mean HR for employed men was significantly lower than that of the short-term unemployed group, $F(5,78) = 3.31, p < .05$.

Cardiovascular measures were also monitored every two minutes while subjects worked on the EFT items and questions. A repeated measures ANOVA again showed no significant differences between groups. The eleven readings produced during this time period were averaged, yielding means for SBP, DBP, and HR. Two-way ANOVAs showed no significant main effects or interactions between groups and control conditions for blood pressure (BP) readings as subjects worked on the EFT. A two-way ANOVA did show that employed men had a significantly lower mean HR when compared to the long-term unemployed group, $F(5, 78) = 3.14, p < .05$ (see Figure 3).

Three readings of BP and HR were taken after the subjects had finished the post-stressor task (EFT) and rested for 15 minutes. These readings were averaged to produce post-stressor means. Two-way ANOVAs revealed that long-term unemployed men (both control conditions) showed a significantly higher SBP, $F(5, 78) = 3.05, p < .05$; and, HR $F(5, 78) = 3.45, p < .05$ than the short-term unemployed group and employed men, respectively. These data do not support the hypothesis that long-term unemployed men would have a more pronounced return to baseline when post-session measures were taken; however, the overall pattern of cardiovascular responding during this experiment does, and will be presented in the discussion section (see Figure 4).

Self-report data

Life events. There were no significant differences between groups on events listed on the modified Social Readjustment Rating Scale (SRRS, Holmes & Rahe, 1969) that had occurred 7 to 24 months preceding this study. Differences were found using a one-way ANOVA on events that had happened during the past six months. Short-term unemployed men reported significantly more events than the employed group, $F(2, 81) = 6.88, p < .05$. Short-term unemployed subjects also had a larger adjustment score than the employed group, $F(2, 81) = 3.12, p < .05$. There were no differences between groups on the total number of events that had occurred over the past two years. Given the time period that was significant on this questionnaire, it is not surprising that the unemployed groups had higher scores than the employed group. This is particularly true for the short-term unemployed subjects who, by definition, had lost their jobs during this period.

Data from the five categories on the SRRS (Holmes & Rahe, 1969) were also examined to explore possible differences between groups in the areas of health, work, home and family, personal and social, and financial events. On the home and family items during the past six months, short-term unemployed men reported more events than the employed group with a one-way ANOVA approaching significance at $F(2, 81) = 2.82, p < .06$. These findings suggest that unemployment initially, is associated with family and marital problems.

A one-way ANOVA indicated that adjustment scores for personal and social events were significant. The data showed that long-term unemployed subjects had a higher adjustment score than employed subjects, $F(2, 81) = 5.26, p < .05$.

Life events supplement. After subjects had completed the SRRS, they were asked to complete the supplement containing all the SRRS items. Analysis showed no differences between groups on the number of items endorsed in each of the four categories. In order to determine if there were differences between groups on the number of items related to employment status only responses 1 (very related) and 2 (somewhat related) were counted for each of the four life categories (these responses were scored 1 and all other responses scored 0). In the category of home and family, a one-way ANOVA showed that short-term unemployed subjects rated more of these items as related to their unemployment $F(2, 81) = 3.40, p < .05$.

A one-way ANOVA showed that long-term unemployed men believed more SRRS financial items were related to their unemployment than employed subjects, $F(2, 81) = 3.77, p < .05$. Examination of the total number of events in the four categories did not indicate any substantial differences between groups.

These results suggest that short-term unemployed subjects were experiencing problems normally associated with the loss of a job; financial concerns are predominate during the first six months, problems arising with family members are common, and facing the need to make significant life-style changes combine to make this period very stressful.

SCL-90-R. Table 4 provides data analyzed by Degoratis (1977) on the mean raw scores of the global indices and symptom dimensions of the SCL-90R for non-patient normals to provide a comparison for the findings of this study.

A one-way ANOVA revealed that the long-term unemployed group endorsed more symptoms than the other two groups on the SCL-90-R General Severity Index (GSI), $F(2, 81) = 6.11$, $p < .05$, while comparison of means showed that short-term unemployed subjects endorsed more symptoms than the employed group. The Positive Symptom Index (PSI) revealed a similar trend with long-term subjects reporting more symptoms than the other two groups, $F(2, 81) = 6.839$, $p < .05$, with means showing that the short-term unemployed group endorsed more items than the employed subjects. The same statistic was used on the final global index, the Positive Symptom Distress Index (PSDI). Interestingly, short-term unemployed subjects reported more intensity than the long-term unemployed group, $F(2, 81) = 4.25$, $p < .05$, whose mean indicated a greater intensity than the employed group (see Table 5).

Analyses of the subscales of the SCL-90-R indicated that the long-term unemployed subjects endorsed significantly more items than the two other groups (again, with the short-term group falling between groups) on all subscales with the

exception of somatic complaints (see Table 6). On three of these subscales, the short-term unemployed subjects endorsed greater intensity and more items than long-term unemployed subjects, who in turn, reported more symptoms than the employed subjects. These subscales measured depression, paranoia, and, hostility. These data support the hypothesis that long-term unemployed subjects would report more psychophysiological complaints than the other two groups.

The five additional questions accompanying the SCL-90-R were designed to address complaints similar to this instrument. The first question asked about feelings of helplessness and was the only one of the five where the three groups differed. Analysis showed that short-term unemployed subjects reported feeling more helpless than the long-term unemployed group, followed by the employed subjects $F(2, 81) = 3.40, p < .05$. The other four questions asked how much subjects avoided people, whether choices mattered or they cared, and finally, if they startled easily.

Ways of Coping 1. One-way analyses of variance on each of the five coping styles revealed that short-term unemployed subjects reported more use of problem-solving strategies than the other two groups, $F(2, 81) = 4.18, p < .05$. Means indicated that the long-term unemployed group tended to use this coping mechanism slightly more than the employed controls. There were no statistical differences between groups on using social support as a coping strategy. Substantially more short-term unemployed subjects reported blaming themselves for being unemployed than employed participants endorsing this way of coping for the stressor they listed, $F(2, 81) = 5.52, p < .05$. The short-term unemployed group

tended to blame themselves slightly more than the long-term unemployed group, however both unemployed groups used self blame more than the employed group. Wishful thinking as a means of coping with stress was endorsed significantly more by the unemployed groups (both had almost identical means) than the employed group, $F(2, 81) = 8.13, p < .05$. The unemployed groups (again having almost identical means) endorsed avoidance as a means of coping with their unemployment significantly more often than the employed subjects did with their stressor, $F(2, 81) = 16.6, p < .05$. None of the additional questions included with this measure approached significance.

The two measures of denial and reappraisal developed by Collins et al. (1983) discussed earlier were examined for differences between groups. A one-way analysis of variance showed that long-term unemployed subjects used denial as a means of coping with their unemployment significantly more than the employed group used denial as a means of dealing with their stressor, $F(2, 81) = 3.52, p < .05$. Similarly, a one-way ANOVA indicated that the employed group used reappraisal more than both unemployed groups, $F(2, 81) = 4.63, p < .05$ with the long-term group scoring lower than their unemployed counterparts.

These data suggest that the use of denial as a coping mechanism by long-term unemployed subjects is paired with a predominate use of emotion-focused coping strategies. This supports the hypothesis that long-term unemployed subjects have little, if any, effective coping strategies to use against the stress associated with unemployment and are more likely to respond to stressors in a helpless manner.

Ways of coping 2. The second administration of the Ways of Coping questionnaire occurred immediately after the recovery readings of blood pressure and heart rate had been taken. A two-way ANOVA revealed main effects for groups and control conditions on the reported use of wishful thinking; the short-term unemployed groups used this coping strategy more often than the employed men, $F(5, 78) = 6.36, p < .05$. Another two-way ANOVA showed as well, that short-term unemployed men reported a significantly greater use of avoidance in coping with the laboratory session than the employed group, $F(5, 78) = 5.60, p < .05$. Neither of these analyses revealed an interaction between groups and control condition.

An examination of the means showed that short-term participants with no control tended to use avoidance more ($M = 10.5, SD = 6.1$) than the employed subjects in the no and perceived control conditions ($M_s = 3.9, SD = 3.5$ and $4.4, SD = 2.8$ respectively) and long-term unemployed men in both control conditions ($M_s = 7.9, SD = 6.0$ and $4.5, SD = 2.4$ respectively). Means again indicated that long-term unemployed subjects without control used avoidance more than the employed men in both conditions. Finally, short-term unemployed subjects in the perceived control condition ($M = 4.4, SD = 2.8$) used avoidance more than the employed/no control group. The use of problem-solving or blaming one's self as ways of coping did not reach significance.

A two-way ANOVA of the question asking subjects whether they believed they could "change some aspect of the situation" showed that there was a two-way interaction between group status and control condition. Short-term unemployed subjects in the perceived control reported more ability to change the laboratory

situation than subjects in the no control conditions, $F(5, 78) = 3.23, p < .05$. None of the other responses to the additional questions included with this measure approached significance. Denial was not endorsed as a significant coping strategy with the laboratory session while at least 80% of each of the three groups reported using reappraisal as a strategy.

These analyses do not support the hypothesis that chronic unemployment is associated with inadequate coping resources. Although the long-term unemployed subjects endorsed more emotion-focused coping strategies than the employed groups, this was over shadowed by the more prevalent use of emotion-focused coping among the short-term unemployed. These findings will be addressed in the discussion section.

Social support and control. Data from the social support scale (Cohen et al., 1984) indicated that the employed group expressed, in general, having a greater degree of social support than both the unemployed groups, $F(2, 81) = 3.55, p < .05$.

The control questions developed by Baum et al. (1983) were included on the social support questionnaire, asking subjects to rate on a 7-point Likert scale how much they agreed or disagreed with each statement. Since these questions have to do with general beliefs in control, both item analyses and an analysis of the total score were performed. There were no differences in how subjects in all groups rated four of these items. Data from one of the questions and the composite score did reveal some differences. Analysis of the statement "I think that one can control what happens to him/her" showed that the long-term unemployed group had a significantly higher score (indicative of a greater sense of being able to control

events) than the other two groups, $F(2, 81) = 3.61, p < .05$. This questionnaire was given before subjects were exposed to the stressor, therefore no analyses of these data were done using groups crossed by control conditions.

Analysis of the data from composite score (summing the five scores) showed that the employed group believed they could control events more than the unemployed groups, $F(2, 81) = 5.51, p < .05$. This last analysis suggests that while having control may be important to long- and short-term unemployed men, their responses do not indicate that, in general, they appeared to believe they actual can control events. Considering the long-term unemployed subjects response to the one direct item asked about control and the fact that these questions are usually analyzed separately, the last analyses must be interpreted with caution.

Desirability of control. No significant differences emerged when one-way ANOVAs were used to examine the scores on the Desirability of Control Scale (Burger & Cooper, 1979); however, post hoc analyses using the least significant differences measure indicated that employed subjects in the perceived control condition were significantly different at the $<.05$ level from the long-term, perceived control group indicating that the former group desired more control than the latter. The highest possible score on this scale is 140 points (higher points representing more desire for control). In examining the means of the groups by condition, it was found that while the employed/perceived control group had a mean of 104.6 (SD = 12.1) the unemployed long-term/no control group was almost the same with less deviation from its mean ($M = 102.1, SD = 8.7$). The other two means indicating a higher desire for control were those of the employed/no control group and the

short-term unemployed/no control group ($M_s = 97.4$, $SD = 17.4$ and 95.8 , $SD = 15.9$ respectively). Burger and Cooper (1979) suggested that individuals who score high on their scale are more susceptible to helplessness in aversive conditions where control is not possible.

Job opportunities questionnaire. Using two-way ANOVAs data were examined to identify feelings of loss of control. Results of these analyses indicated there were no main effects for groups or interactions between groups and control condition in the four categories: direct loss of control; indirect loss of control; environmental filler questions; and general fillers.

Appraisal of the noise and task stressor. The appraisal questionnaire piloted by Lester (1991) was administered twice during the experimental session. Three of the items were reversed for scoring with a higher score reflecting a positive appraisal of one's ability to cope with the noise and task stressor. The items, in order, asked subjects about coping with, feeling uncomfortable about, finding a way to do well, acknowledging challenge, feeling threatened, and lastly, not having much control over the up-coming stressor. The first administration of this questionnaire occurred immediately before the experimenter left the sound chamber to begin the noise and task part of the study. Subjects had already been shown examples and given instructions about the tasks and the noise but had not been told about the "button" if that participant was in the perceived control condition. No significant differences were found between groups on the six items or on the total score.

Appraisal of the EFT. The second administration of the seven appraisal items occurred immediately before subjects had started working on the EFT. Two-way ANOVAs performed on each of the items and the total score showed no main effects for groups or an interactions between group and control condition.

Performance on the Embedded Figures Task

There were no significant differences between groups and their two respective conditions (perceived or no control) on the number of EFT items attempted. A two-way ANOVA showed a main effect for number of items solved correctly. The employed group solved more EFT items than the short-term unemployed subjects, $F(5, 78) = 2.97, p < .05$. Long-term unemployed participants solved more items ($M = 4.7, SD = 4.4$) than the short-term group ($M = 2.7, SD = 3.7$), and were closer in the items solved to the employed subjects ($M = 5.8, SD = 4.0$). Interestingly, although none of the subjects correctly solved all the items, only two participants correctly solved 14 items; one employed subject in the no control condition and a long-term unemployed subject in the perceived control condition (see Table 7).

When the groups were crossed by conditions a similar but not significant pattern emerged. Employed subjects in both conditions correctly solved more EFT items. In descending order of items solved correctly were: the long-term unemployed, perceived control group ($M = 5.2, SD = 4.5$); long-term unemployed, no control subjects ($M = 4.3, SD = 4.3$); followed by the short-term unemployed, perceived control and short-term unemployed, no control groups ($M_s = 3.5$ and 1.9 with $SDs = 4.4$ and 2.8) respectively (see Table 8).

Although there were no significant differences between groups on the numbers of EFT items marked "0", or skipped, the unemployed groups skipped more items than employed subjects. The mean number of items skipped in the employed group was 1.4 (SD = 2.0). The long-term and short-term unemployed subjects had means of 2.8 and 2.3 (SDs = 3.6 and 3.0) respectively. This suggests that long-term unemployed subjects were more likely to skip items. When the groups were crossed by conditions, it became clear that the long-term and short-term unemployed subjects in the no control conditions skipped more items than the other groups, Ms 3.1 (SD = 3.8) and 3.2 (SD = 3.9) respectively. There were no significant differences between groups or groups crossed by conditions on items marked "X" (impossible to solve) or in the number of EFT items solved incorrectly.

Although the number of items attempted was examined and no differences were found, analysis of the items "not reached" was made. This was necessary in order to accurately test persistence on the EFT, in the event that some subjects may have simply gone through all the items without regard to accuracy. The employed group (both conditions) reached more items than the unemployed groups. Employed subjects in the perceived control condition had a mean of 4.3 (SD = 3.8) while their counterpart in the no control condition had a mean of 3.2 (SD = 3.4) items not reached. The long-term unemployed subjects in the no control condition followed with a mean of 4.5 (SD = 3.3) and long-term unemployed men in the perceived control condition with a mean of 4.6 (SD = 3.3) items not reached. The short-term unemployed groups had the greatest number of items not reached, with

the no control half having a mean of 5.8 (SD = 3.8) and the perceived control short-term group having a mean of 5.3 (SD = 4.5) items not reached. In summary, it appears that the employed groups reached the greatest number of items, followed by the long-term unemployed groups (both conditions). While there appeared to be no differences between groups on the number of items attempted, the short-term unemployed men having no control did not reach approximately 6 of the 16 items and those men in the short-term unemployed perceived control condition had more than four items left to work on when the experimenter stopped them at the end of the allotted 20 minutes.

Embedded Figures Persistence

Subjects were told they would have five minutes to complete the practice item. There were no significant differences between groups or groups crossed by conditions on whether the subjects solved or did not solve the item; however, over 50% of the subjects in all groups failed to solve the practice item. The majority of all subjects spent less than five minutes on the practice item, without a discernible pattern between groups.

Twenty six (72%) of the employed subjects, 13 in each condition, spent the full 20 minutes on the tasks. Among the short-term unemployed, 11 of the 12 men in the no control condition took the entire time allotted, while 10 of the 12 subjects in the perceived control condition took the same length of time. One hundred percent (12) of the long-term unemployed subjects in the no control condition persisted for the full 20 minutes, and 9 of the 12 men in the perceived control

condition did the same. Persistence was measured by the total number of seconds spent on the tasks divided by the number of items attempted.

A two-way ANOVA indicated there were no significant main effects or interactions between groups and control conditions; however, examination of the means of the groups showed two interesting patterns. Mean measures of persistence by group showed that long-term unemployed men persisted less than the other two groups, with short-term unemployed subjects persisting the longest amount of time.

When groups were crossed by control conditions, a different pattern emerged. These means showed that employed/no control men persisted the least amount of time compared to all other groups; both long-term unemployed groups followed the former group with short-term unemployed/perceived control subjects spending the most amount of time on the EFT items.

Embedded Figures Task questionnaires

A two-way ANOVA showed no significant main effects or interactions on the sets of questions preceding or immediately following the practice item.

Five identical questionnaires consisting of seven items were inserted after every three task items resulting in each question being repeated five times. Data from four of the items (questions one, four, six, and seven, see EFT-Form A) on each questionnaire will be reported first. Each question was examined individually and as a set. Overall, there were no significant main effects for groups or interactions between groups and control conditions when the questions were

analyzed as a set; however, several findings were obtained using separate two-way ANOVAs.

At the fourth administration of the question asking how hard subjects had tried to solve the previous three puzzles, a main effect for groups was shown, in that employed subjects reported trying harder on the preceding items than the long-term unemployed group, $F(5, 78) = 3.05, p < .05$. Analyses of the questions addressing subjects' performance expectations believed to be held by the experimenter revealed that at the third administration, the employed group believed the experimenter held higher expectations of their performance when compared to the short-term unemployed men, $F(5, 78) = 3.35, p < .05$. At the fourth administration, employed men reported believing the experimenter held higher performance expectations of them compared to the long-term unemployed group, $F(5, 78) = 3.11, p < .05$.

When asked for the third time how hard they planned to work on the next items, a two-way ANOVA showed a main effect for groups in that the employed group planned to work harder than the short-term unemployed group, $F(5, 78) = 3.19, p < .05$. Finally, at times three and four two-way ANOVAs showed that the employed group indicated that it was more important for them to do well on the upcoming items than the short-term unemployed subjects, $F(5, 78) = 3.59, p < .05$ and $F(5, 78) = 3.32, p < .05$, respectively. The data from these four questions will be addressed in more detail in the next section.

The remaining three items (questions two, three, and five) on each questionnaire asked the subjects: first, what was the most important thing learned

from the previous items; secondly, what they believed to be the second most important thing to be learned from the next items; and last, the most important reason for their performance to that point. The response set for each of these questions was: the abilities needed; the effort needed; and, the difficulty of the EFT itself. Two-way ANOVAs were performed on each response and response set (times one through five) with no significant main effects for groups found or interactions between groups and control conditions.

Since response to these three sets of questions were found to be significant in the study conducted by Baum and colleagues (1986), summary statistics were used to further explore these data. Assuming all 84 subjects answered each of these three questions five times, there were 420 possible responses. However, not all subjects completed the EFT in the 20 minutes allowed and some finished in less than the allotted time. For the purposes of examining these questions a positive response was coded "1". Crosstabulations provided numbers and percentages of those who positively answered each of the questions, did not reach a question, and those who chose another answer. The latter two responses were coded "0". For example, an employed subject who endorsed effort or difficulty was coded a "0" on the ability response. Tables 9 through 11 show the number of subjects by groups endorsing or not endorsing each of the three possible answers. The number and percentages of participants who did not reach any of these items appear also in these tables.

These findings did not strongly support the Baum et al. (1986) data suggesting that long-term unemployed men correctly identified the difficulty of the

EFT (more often than the other groups) as the reason for performance. When taking into account the number of subjects who did not reach all the items, the data show that a slightly higher percentage of subjects in the long-term unemployed group endorsed the difficulty of the EFT items as the primary factor influencing successful performance on the EFT. This percentage was lower than the percentage of employed men endorsing this reason as the correct factor for solving the items.

The final form subjects completed consisted of six questions. The first question was a manipulation check, asking if the subjects did or did not believe the study was examining something other than what they were told. If a subject answered yes to this question, item two asked what he believed was being tested. Although approximately one third of the subjects answered yes to question one, none indicated they knew the purpose of the study. Question three asked if the noise interfered with their performance on the tests; most subjects agreed that it did. Next, subjects were asked if there was anything they could have done to stop the noise. All subjects in the perceived control condition answered affirmatively. Some subjects in the no control condition also gave a positive response. Question four was open-ended and inquired what could have been done to stop the noise.

Participants in the perceived control condition unanimously wrote something to the effect that pushing the button would turn off the noise. Subjects in the no control condition entered a variety of responses, none of which indicated they knew that the button would stop the noise. The last question asked if the subjects had any specific questions for the experimenter about the study. Approximately 50%

of the subjects did have questions, all of which were dealt with in the general debriefing. In summary, the results of the analyses of the data from this study confirmed that long-term unemployed subjects were exhibiting symptoms of chronic stress. These data indicated a significantly higher cardiovascular reading among this groups compared to the two others. Results from the analyses of responses to the SCL-90-R showed that, again, compared to the short-term unemployed and employed groups, long-term unemployed men were experiencing substantially more psychological problems. Data from the Ways of Coping questionnaires were indicative of a more pronounced use of emotion-focused strategies among the chronic unemployed group. Hypotheses concerning the direct effects of loss of control associated with chronic unemployment on subsequent appraisals of laboratory stressors, performance and persistence on the post-stressor EFT, and helplessness were not borne out by these data. Despite, the lack of significant findings concerning how loss of control associated with chronic unemployment affects response to subsequent stressors in this study, several trends in these data, suggest that the hypothesized relationship may not have been adequately tested and will be further explored in the following section.

Discussion

The primary objective of this research was to use a specific exemplar of chronic stress, in order to identify psychological mechanisms that exacerbates symptoms of chronic stress and lead to a generalization that all stressful situations are unmanageable. Specifically, this study's hypotheses were partially based on prior evidence that loss of control associated with chronic unemployment generalizes to acute laboratory stressors. In addition, the hypotheses were designed to test Wortman and Brehm's (1975) theory that reactance precedes learned helplessness.

The psychological factors that were examined using self-report included psychosomatic complaints, appraisals of the laboratory stressor and after-effects task, perceptions of control, and coping. Further, it was hypothesized that symptoms of chronic stress such as elevated blood pressure and heart rate, pronounced physical and emotional complaints, and poor task performance and lack of persistence would substantiate the hypothesis that loss of control associated with chronic unemployment would generalize to the laboratory situation. These hypotheses were tested on a sample of employed, short-term unemployed, and long-term unemployed men. Half of the men in each of the three groups were randomly assigned to a perceived control condition, in which, they were led to believe they could potentially control the laboratory stressor. The other participants

were given no indication they could control the stressor. All subjects were exposed to the same stressor (loud, intermittent noise while working on cognitive tasks), and a post-stressor task.

In order to facilitate an orderly discussion, a review of the findings that support this study's hypotheses will be presented first. This will be followed by an overview of the data trends suggestive of a direct relationship between loss of control associated with chronic stress and response to subsequent stressors. The literature and the data from this study relevant to the unique stressors associated with unemployment will then be discussed, followed by comments on methodological problems and suggestions for future research.

Baseline cardiovascular data (BP and HR) supported the first hypothesis that long-term unemployed subjects would enter the laboratory situation with higher readings of BP and HR compared to the other two groups. In addition, data from the SCL-90-R also supported the first hypothesis that long-term unemployed subjects would report substantially more health complaints. Analyses showed that on two of the three major indices, long-term unemployed subjects were more symptomatic (GSI) and that their symptoms were more severe (PSI) than employed subjects.

Long-term unemployed subjects scored significantly higher on the SCL-90-R subscales measuring obsessive/compulsive symptoms, psychoticism, interpersonal sensitivity, anxiety, and phobic anxiety. High scores on the last three subscales are indicative of a person who is withdrawing from others and continually worries about events or situations. High scores on the obsessive/compulsive subscale could be

a response to the chronic nature of their unemployed status; individuals may repetitively think about the circumstances of their job loss or meticulously plan for interviews. All of these symptoms suggest a loss of control associated with chronic unemployment.

A comparison of the raw scores obtained in this study was made to non-patient norms reported by Derogatis (1977). Both short- and long-term unemployed subjects scored much higher on the three major indices and all the subscales with the exception of somatic symptoms. Raw scores for the employed group were comparable (exact on some subscales) to the non-patient norms. Although there were no differences between groups the somatic items, means on this subscale were in the predicted direction (see Table 6).

Data from the first administration of the Ways of Coping Scale (Folkman & Lazarus, 1980) showed that employed men used a more problem-focused approach to stress while unemployed subjects tended toward a much more emotion-focused strategy. Previous research, particularly the studies discussed in this dissertation, has indicated that difficulty in managing emotional response to stress (blaming one's self or avoidance) is associated with uncontrollability. Therefore, these data contribute support to the second hypothesis that unemployment is associated with an inability to effectively cope with stress and a sense of uncontrollability. The endorsement of more avoidance strategies and denial by the long-term unemployed subjects in attempting to manage unemployment stress is suggestive a loss of control.

Analysis by groups showing less persistence on the EFT items on the part of the long-term unemployed group, and greater persistence by the short-term unemployed group, supports hypotheses two and four. First, that loss of control associated with long-term unemployment would be generalized to the laboratory session resulting in less persistence. Secondly, that short-term unemployed subjects having experienced some loss of control due to their recent job loss would respond to the after-effects stressor with reactance.

The second time subjects completed the Ways of Coping (Folkman & Lazarus, 1980), the data indicated that short-term unemployed subjects, in both control conditions, endorsed the use of emotion-focused coping more than any other group. Although results were not significant on the use of problem-solving strategies, means of the employed and short-term unemployed were similar (Ms 22.11 (SD = 8.16) and 22.88 (SD = 9.21, respectively), while long-term unemployed men reported using this strategy less (M 18.96, SD = 8.08). The higher endorsement of emotion-focused strategies by the short-term unemployed subjects was surprising and led to a closer examination of the data. When scoring this questionnaire, the responses "rarely used", "sometimes used", and "regularly used" are assigned values of 1, 2, and 3. The response "never used" is scored 0. When individual responses to the five coping strategies were summed, the long-term unemployed men consistently scored lower than the other two groups .

This appears to indicate that this group responded "never used" more often. This finding could indicate that these subjects simply were not effectively coping with the laboratory situation, and, in turn, could be interpreted as a result of loss of control associated with chronic unemployment, tentatively supporting the second hypothesis.

Although the first hypothesis concerning higher cardiovascular baseline readings among the long-term unemployed was confirmed, this pattern continued throughout the session when it had been predicted to decline over time, as the men in this group began to view the session as another instance of a situation they could not control (hypothesis seven). An examination of the mean measures of BP and HR during all phases of the study session offered an interpretation of these data more in line with this hypothesis (see Table 16). Although differences across time periods are small, they do follow a pattern. Long-term unemployed men had higher mean baseline measures than all groups. The means of the three measures, SBP, DBP, and HR, were slightly higher during the noise and tasks stressor, decreasing almost to baseline during the EFT stressor (except HR), and were almost identical to baseline when taken post session. This pattern, although means were significantly higher than those of the other two groups, followed the predicted direction.

Contrary to the second hypotheses, analyses showed that there were no differences between groups or groups crossed by control conditions on appraisals of the noise and tasks stressor.

Results from analyses of the Desirability of Control Scale (Burger & Cooper, 1979) and the control questions developed by Baum and colleagues (1983) indicated that, in general, employed subjects scored higher on these self-report measures than the unemployed groups. The significant difference found on one of the Baum et al. (1983) items showing that long-term unemployed subjects agreed more with the statement "I think that one can control what happens to him/her." The high means of these participants on the Desirability of Control Scale did not confirm the third hypotheses that held that long-term unemployed subjects would be unable to effectively cope with the laboratory stressor.

Hypothesis five was not confirmed in the data analyses. The finding that employed/no control subjects persisted less on the EFT, may have been a result of believing they did not have control during the noise and tasks stressor or simply, that these men solved the items in a lesser amount of time than other subjects. The latter interpretation is more likely, given that men in this group solved more items and appeared to be coping more effectively during the laboratory session.

When the appraisal questionnaire was administered before subjects began working on the EFT, again, there were no significant main effects for groups or interaction between groups and control conditions on the summed total score. Analyses of the six individual items showed that long-term unemployed men, in response to question 4 (challenging but not concerned) felt significantly less concerned about the EFT. This also shows that this group saw the up-coming stressor as a challenge more than the other groups.

These findings do not support hypotheses six that loss of control associated with chronic unemployment will negatively impact appraisal of the stressors.

There was no evidence from these data that the majority of the long-term unemployed subjects correctly identified the difficulty of the EFT as the correct reason for their performance as was found in the study conducted by Baum and colleagues (1986). Their findings were suggestive of prior experience with non-contingent relationships and supported the hypothesis that loss of control associated with chronic unemployment generalizes to subsequent stressful situations. While a slightly higher percentage of subjects in the long-term unemployed group identified difficulty as the most important factor in correctly solving EFT items, a similar, and slightly higher percentage of the employed group also correctly endorsed task difficulty as the critical factor.

Hypotheses five was not confirmed in that mean cardiovascular measures for employed subjects increased during the noise and tasks stressor, decreased slightly during the EFT stressor, and remained slightly elevated during post-session (except HR, which was below baseline) measurements.

Among short-term unemployed subjects baseline measures were similar to the employed. These subjects mean readings increased less than the employed group's during the noise and task stressor (except HR), and remained more elevated during the EFT and post-session readings (except HR). These patterns do not support hypotheses seven, that short-term unemployed subjects' blood pressure and heart rate would be more elevated than that of the employed subjects due to reactance.

The lack of substantial differences between groups on educational background points to the pervasiveness of unemployment. The data indicating that the majority of unemployed men were either single, separated, or divorced attests to the financial strain and the burden, unemployment puts on relationships. Due to the lack or loss of a job, younger men may delay entering a committed relationship, while unemployment is likely to be a contributing factor to the dissolution of marriage in older, previously married men.

Demographic differences between the employed and unemployed groups that require further discussion are the length of time at, and type of current residence. All but 14% of the employed subjects had lived in their current homes for more than one year. In contrast, half of the unemployed subjects had lived at their current residence for less than one year with the majority of the remaining men residing in their current residences between one to two years.

Employed participants owned or rented apartments, single family homes, or townhomes. Only one unemployed subject owned his home. The remaining unemployed men either rented (56%) or did not financially contribute toward their living quarters (42%). The latter group of unemployed men were currently living in a shelter or group home. From the unemployed subjects responses to these questions, a sense of transience emerges; shelter, one of the most basic human needs, may become unavailable at any point in time. This is one of the more potent stressors facing the unemployed and will be discussed further in the section on homelessness.

The data showing that symptoms of depression, hostility, and paranoid ideation were more prevalent among the short-term unemployed is not unexpected. Losing one's job and unsuccessful attempts to find another lead to lower self-esteem and depressive affect. The higher scores on hostility could be interpreted as reactance; anger possibly directed toward former employers, and adoption of a hostile attitude in an attempt to regain a loss of control. Symptoms of paranoid ideation may stem from feeling that others (i.e., past employers, family members) are finding fault and blaming the unemployed person for something he or she could not control.

Analyses of the data from responses to the SRRS (Holmes & Rahe, 1967) and supplement supported the data from other studies suggesting that short-term unemployment is associated with marital and family conflict and is also disruptive to other personal and social relationships. Both short- and long-term unemployed participants rated more home and family events as being related to being without a job. It was only on the supplement to the SRRS that differences between groups became apparent on the cluster of financial events; long-term unemployed men, more than those in the other groups, reported that financial matters were significantly related to their unemployed status.

This discussion of stressors associated with unemployment would be incomplete without some mention of the literature suggesting that homelessness is almost inseparable from chronic unemployment.

The data reported by Shlay and Rossi (1992) suggesting that unemployment and homelessness are paired much more frequently now than in past may very well be currently affecting subjects who participated in this study. The scarcity of inexpensive housing, the current cut-backs in social services, and retrenchment in government and the private sector offer little hope for people without jobs. The data from this study indicating that there were no major differences in educational background or work skills between groups suggests that unemployment is not a result of a lack of skills or education. The current job market often forces qualified people to take entry-level positions or even positions outside their areas of expertise.

The criteria for inclusion in this study automatically understates the crises faced by many long-term unemployed men. As mentioned, approximately 50% of the short-term unemployed group were either living in a temporary shelter or group homes. The remaining unemployed subjects in this study were relying on family members income and housing, and very few were received any federal or state aid.

Since homelessness was not a factor in this study, the only data that partially address this issue was the length of time subjects had lived at their current residence. Fifty percent of subjects in the unemployed groups reported living at their current residence for less than one year. Those living in a shelter were doing so on a temporary basis. Two respondents scheduled for this study were forced to move away from the area to find work between the time they were interviewed and

the appointment time (approximately two or three days). Shlay and Rossi (1992) point out that homelessness is often an episodic condition. This clearly could be related to the availability of permanent work.

The literature suggesting that people who are chronically unemployed are more likely to be homeless represents a possible confound in future unemployment research. If a substantial number of unemployed people are also homeless how would this group be adequately sampled? During the 1990 census, census takers attempted to enumerate both people in shelters and living on the street; only a small portion of the people living without shelter could be accurately accounted for (Applebaum, 1990). Investigators may find it difficult but necessary to separate these issues.

Unemployment, as a research topic is complex at best; however, if homeless subjects are included, factors uniquely associated with homelessness are likely to interact with the stress of unemployment.

The results of this dissertation research attest to the overlapping nature of the variables examined and measures taken during this study. The comparison between employed and unemployed groups using the data from the first administration of the Ways of Coping potentially misrepresents how the employed group would cope with a stressor as personally relevant as unemployment. As previously described, employed subjects were thinking of a stressful event that had occurred to them during the past year. Most of the stressors listed by these subjects were considerable less distressful than being unemployed and had not

necessarily occurred recently. Despite this potential confound, having subjects report how they cope with a stressor other than the laboratory session contributed valuable information to this study.

A major problem in attempting to show that loss of control associated with long-term unemployment directly affected subsequent appraisals and generalized to feelings of uncontrollability when confronted with other stressors was methodological. A reliable and valid measure of loss of control does not yet exist. This is not due to a lack of interest or effort, but rather the result of the elusive nature of the construct.

Individual differences, gender differences, and the situational context are only a few of the problems encountered when trying to develop such a measure.

The lack of a reliable and valid measure for assessing loss of control associated with chronic unemployment (or chronic stress in general) made it necessary to use measures designed to tap other aspects of control thought to be related to the construct. If the Burger and Cooper (1979) scale and the items developed by Baum and colleagues (1983) accurately assessed the subjects' beliefs regarding their ability to control external events, then it would appear that loss of control associated with chronic unemployment does not generalize to subsequent sources of stress.

Summary and conclusions

The hypothesis that long-term unemployed men would show symptoms of chronic stress were confirmed by the results of the SCL-90-R and baseline cardiovascular readings. The remaining hypotheses concerning cardiovascular response were more difficult to interpret due to the small differences between the mean readings. These findings indicate that it would be more appropriate to use multiple physiological measures including BP and HR. Urinary catecholamines, and possibly blood levels of catecholamines would provide a broader base to investigate the somatic response to chronic stress.

The hypotheses concerning self-reported appraisal of both stressors and control among the long-term unemployed were not confirmed. Data from the two measures of appraisal showed that it was quite clear that compared to the other two groups, long-term unemployed subjects (particularly those in the no control condition) appraised both stressors as events that were challenging but did not threaten them or their beliefs concerning their ability to control the laboratory session. Analyses of the control measures indicated that the employed subjects expressed a higher desire for control compared to the short-term groups; however, mean scores also showed that long-term unemployed men were very similar to the employed groups.

The data did not completely support the notion that specifically, loss of control associated with chronic unemployment, adversely affected EFT performance. Long-term unemployed subjects in the perceived control condition

correctly solved almost as many items as the employed group; however, their counterparts in the no control condition solved fewer items correctly.

There is, however, evidence to support the hypothesis that loss of control (whether associated with chronic unemployment or with the noise and tasks stressor) is associated with performance deficits. The control manipulation resulted in poorer performance among the two unemployed no control groups, when compared to their perceived control counterparts.

The other hypotheses regarding performance on the EFT specifically, reactance due to perceived loss of control, and unaffected scores if the task was simply perceived as another laboratory task deserve additional comment. It was expected that short-term unemployed men in the no control condition would respond to the loss of control during the noise and tasks stressor by attempting to regain control. Instead, subjects appeared to become more helpless-like, averaging the least number of EFT items solved. Subjects in the employed/no control group, solved the highest number of items; their performance could be interpreted as reactance, especially considering they accomplished this in the shortest persistence time. It was anticipated that employed subjects in the perceived control group would perceive the EFT as the other task that was described at the beginning of the session. This group's mean number of items solved was higher than all groups except their counterparts in the no control condition.

Hypotheses concerning persistence by group on the EFT were confirmed with the exception of the employed subjects in the no control condition that has already been discussed. However, when the groups were crossed by control

condition, the predicted direction of persistence within groups was reversed. Although long-term unemployed subjects persisted less than the other groups; subjects in the no control group persisted slightly longer than those in the perceived control group (Ms 97.15 and 91.21, respectively). Differences in persistence within the short-term unemployed group followed the same pattern. Employed subjects in the perceived control group persisted slightly longer than the short-term, no control subjects.

No specific hypothesis was made concerning the finding by Baum and colleagues (1986) that in their sample, long-term unemployed men correctly identified difficulty of the EFT items as the factor responsible for successful performance. Their finding however, was suggestive of prior experience with noncontingent relationships (Baum et al., 1986). If this finding had been statistically significant in this study, a much better argument could be made for the hypothesized relationship between loss of control associated with chronic unemployment and its generalization to other sources of stress.

Analyses of the one item addressing this issue did reveal that a higher number of subjects in the long-term unemployed group endorsed difficulty of the EFT as the most important reason for success. While this finding was encouraging, a slightly higher number of employed subjects also identified this as the correct factor.

Although these data support the notion that long-term unemployment is a chronic stressor, the hypotheses concerning the effect of loss of control associated with chronic unemployment were not clearly confirmed. Self-reported appraisals

on the part of long-term unemployed subjects for both the noise and tasks stressor and the EFT reflected a very positive attitude toward both. In fact, both short- and long-term unemployed men were more optimistic about these up-coming stressors compared to employed subjects. The two groups of unemployed subjects both rated the stressors as more of a challenge than employed subjects; with long-term unemployed subjects reporting a higher degree of challenge. As previously discussed, when stressors are evaluated as challenging, individuals tend to believe they will be able to deal with them effectively (Coyne & Lazarus, 1980).

Scores on the Burger and Cooper (1979) scale and the Baum et al. (1983) items indicated that long-term unemployed subjects were higher in desire for control and more confident about their ability to control external events than employed subjects. Assuming this is the case, perhaps subjects in the long-term unemployed condition were reporting a higher belief in the control than they actually felt. These subjects may have felt that compared to the loss of control they were experiencing as a result of chronic unemployment, the laboratory stressors were mild or not personally relevant. In addition, Burger and Cooper (1979) did caution that people high on this measure may show symptoms of helplessness in situations where control is not possible.

One final alternative interpretation of these data is based on cognitive dissonance theory (Festinger, 1959). Again, the data supporting the hypotheses that long-term unemployment is associated with symptoms of chronic stress and related to loss of control are a higher cardiovascular baseline, self-reported symptoms on the SCL-90-R and use of a predominately emotion-focused coping

style. Measures that do not indicate a generalization to the laboratory stressors due to loss of control associated with chronic unemployment are the evaluations made by the long-term unemployed men that neither of the laboratory stressors were threatening or uncontrollable, no self-report indicative of lack or loss of control, and performance on the EFT.

Response to a chronic stressor is usually associated with feelings of loss of control; certainly when a person has lost a job and can not find another, there is at least some degree of loss associated with such a series of events.

Other research has shown that even short-term unemployment is associated with loss of self-esteem and the inability to control financial resources (Hepworth, 1980; Kessler et al., 1987). In fact, data from this study show that short-term unemployed men are experiencing stress-related symptoms, rating the stressors as more threatening and uncontrollable than the long-term unemployed group, and deficits in performance on the EFT.

Among the long-term unemployed, job loss followed by a lingering period of losing control over significant aspects of one's life such as increasing financial difficulties, trouble with significant others, and loss of self-esteem, may be in such conflict with beliefs that have previously gone unchallenged until job loss occurred may result in a state of cognitive dissonance.

When unemployed subjects completed the first coping measure, the long-term unemployed group reported using denial significantly more than the employed group. As previously mentioned, employed subjects were instructed to think about a stressor that had occurred to them during the past year, therefore the

comparison between long-term unemployed group and the employed subjects could possibly be measuring different sources of stress.

Examination of differences between the two unemployed groups on this item revealed that 63% of long-term unemployed men reported using denial, while only 54% of the short-term unemployed group used denial as a strategy when thinking about their unemployment situation. It is understandable that the period immediately following job loss would be associated with the use of denial; thus it would seem that the short-term unemployed group should be in more of a denial state than the other groups.

During the second administration of the coping scale, the percentages of subjects endorsing the use of denial changed; 22% of the employed subjects reported using denial as a coping strategy with the laboratory session, 42% of the short-term unemployed group endorsed denial, but, only 17% of the long-term unemployed group reported using this strategy to cope with the laboratory session. This suggests that long-term unemployed subjects are actively denying the seriousness of being unemployed but not using this means of coping with the laboratory stressors and other components of the session.

Examination of the use of denial reported by the subjects appears to explain the positive appraisals and lack of symptoms of helplessness or uncontrollability among the long-term unemployed group. In terms of cognitive dissonance, long-term unemployed subjects in this sample are faced with two conflicting beliefs. These subjects may either cognitively acknowledge the loss of control associated

with chronic unemployment and its attendant consequences or choose to ignore or deny that their circumstances are extremely stressful.

The data from this study indicate that these subjects have chosen to devalue thoughts and beliefs that are consonant with being unemployed and have managed to alter their beliefs and/or attitudes through denial. If this is the case, then these subjects' self-reports about their evaluations and the perceived controllability of stressful events would also be viewed as non-threatening and controllable. At the same time, measures that are difficult to control cognitively would reflect stress, just as elevated cardiovascular response and stress-related symptoms did in this study. The discrepancies between the results from this study and the research conducted by Baum and colleagues (1986) are open to question. To resolve the differences in findings would require further study.

It does seem improbable that this sample is not representative of most long-term unemployed individuals or was unintentionally drawn from an unusual population.

In summary, some of the measures used in this study support the hypothesis that loss of control associated with chronic unemployment mediate response to subsequent stressors. The hypotheses concerning the relationship between loss of control associated with a given chronic stressor and appraisals or perceived control of other sources of stress were not supported. Alternative explanations of the data from this study have been offered, and methodological issues reviewed, particularly the need for an adequate measure of loss of control. Future studies of chronic unemployment must also take into account its relationship to homelessness

and the possibility that this stressor is so potent, that individuals confronted with indefinite joblessness may develop psychosomatic illness.

Table 1

MARITAL STATUS BY GROUPS

	SINGLE	MARRIED	SEPARATED OR DIVORCED	Row Total
EMPLOYED	16	18	2	36 42.9%
SHORT-TERM UNEMPLOYED	13	2	9	24 28.6%
LONG-TERM UNEMPLOYED	15	4	5	24 28.6%
Column Total	44 52.4%	24 28.6%	16 19.0%	84 100%

$$\chi^2(2, N = 84) = 15.76, p < .05$$

Table 2

HIGHEST EDUCATIONAL LEVEL ACHIEVED BY GROUPS

	LESS THAN SOME COLLEGE	BACHELOR'S DEGREE OR HIGHER	Row Total
EMPLOYED	17	19	36 42.9%
SHORT-TERM UNEMPLOYED	11	13	24 28.6%
LONG-TERM UNEMPLOYED	20	4	24 28.6%
Column Total	53 63.1%	31 36.9%	84 100%

$$\chi^2 (2, N=84) = 15.76, p < .05$$

Table 3

CURRENT OR PREVIOUS OCCUPATION CATEGORY				
	SEMI- SKILLED	SKILLED	PROFESSIONAL	Row Total
EMPLOYED	3	23	10	36 42.9%
SHORT-TERM UNEMPLOYED	19	5	0	24 28.6%
LONG-TERM UNEMPLOYED	5	14	5	24 28.6%
Column Total	27 32.1%	42 50%	15 17.9%	84 100%

$$\chi^2(4, N = 84) = 6.62, p < .05$$

Table 4
 MEAN RAW SCORES ON THE GLOBAL INDICIES AND SYMPTOM
 DIMENSIONS SCL-90-R FOR NON-PATIENT NORMALS
 Derogatis, 1977

	<u>M</u>	<u>SD</u>
General Severity Index	.31	.31
Positive Symptom Total	19.29	15.48
Positive Symptom Distress Index	1.32	.42
Somatization	.36	.42
Obsessive-Compulsive	.39	.45
Interpersonal Sensitivity	.29	.39
Depression	.36	.44
Anxiety	.30	.37
Hostility	.30	.40
Phobic Anxiety	.13	.31
Paranoid Ideation	.34	.44
Psychoticism	.14	.25

Table 5

**SUMMARY OF SCL-90-R MAJOR INDICES
RAW SCORE MEANS BY GROUP**

	SHORT-TERM UNEMPLOYED	LONG-TERM UNEMPLOYED	EMPLOYED
General Severity Index	.58 ^{ab} (SD = .44)	.59 ^{*a} (SD = .31)	.31 ^b (SD = .32)
Positive Symptom Total	31.50 ^{ab} (SD = 20.52)	34.08 ^{*a} (SD = 15.47)	18.86 ^b (SD = 15.97)
Positive Symptom Distress Index	1.55 ^{*a} (SD = .50)	1.47 ^{ab} (SD = .34)	1.23 ^b (SD = .46)

* significant at <.05

TABLE 6
SUMMARY OF SCL-90-R SUBSCALES MEAN RAW SCORES BY GROUP

	SHORT-TERM UNEMPLOYED	LONG-TERM UNEMPLOYED	EMPLOYED
Somatization	.34 (SD = .36)	.34 (SD = .31)	.28 (SD = .26)
Obsessive- Compulsive	.68 (SD = .56)	.76 ^{*a} (SD = .57)	.43 ^b (SD = .42)
Interpersonal Sensitivity	.67 ^{ab} (SD = .65)	.87 ^{*a} (SD = .63)	.42 ^b (SD = .50)
Depression	.87 ^{*a}	.86 ^{ab}	.43 ^b
Anxiety	.45 ^{ab} (SD = .54)	.48 ^{*a} (SD = .44)	.21 ^b (SD = .33)
Hostility	.60 ^{*a} (SD = .59)	.37 ^{ab} (SD = .31)	.28 ^b (SD = .29)
Phobic	.18 ^{ab}	.24 ^{*a}	.04 ^b
Paranoid			
Psychoticism	.40 ^{ab}	.46 ^{*a}	.16 ^b

* significant at <.05

Table 7

**EMBEDDED FIGURES TASK RESULTS
SUMMARY OF ITEM MEANS**

	SHORT-TERM UNEMPLOYED	LONG-TERM UNEMPLOYED	EMPLOYED
ITEMS SOLVED CORRECTLY	2.71	4.71	5.81
INCORRECT RESPONSE	7.43	6.72	6.49
ITEMS ATTEMPTED	10.5	11.46	12.25
ITEMS NOT REACHED	5.50	4.54	3.75

TABLE 8
 EMBEDDED FIGURES TASK RESULTS
 SUMMARY OF ITEM MEANS
 GROUPS CROSSED BY CONTROL CONDITIONS

	<u>No</u> <u>Control</u>	<u>Perceived</u> <u>Control</u>
Employed	a) 6.11	a) 5.5
	b) 1.39	b) 2.78
	c) 1.72	c) 1.06
	d) 3.56	d) 2.44
Short-term Unemployed	a) 1.92	a) 3.50
	b) 2.83	b) 2.75
	c) 3.17	c) 1.33
	d) 2.25	d) 2.50
Long-term Unemployed	a) 4.25	a) 5.17
	b) 1.92	b) 1.33
	c) 3.08	c) 2.50
	d) 2.17	d) 2.42

a) = M Items Solved Correctly

b) = M Items Solved Incorrectly

c) = M Items Skipped

d) = M Items Marked Impossible

TABLE 9

SUMMARY OF THE NUMBER AND PERCENTAGES OF SUBJECTS
 ENDORSING
 ABILITY AS THE MOST IMPORTANT THING THEY HAD
 LEARNED FROM THE PREVIOUS EMBEDDED FIGURES TASK ITEMS*

	Ability Endorsed	Ability Not Endorsed	Number of Subjects not Answering	Summary of Total Responses
Employed	42 (23%)	88 (49%)	50 (28%)	= 180
Short-Term Unemployed	17 (14%)	53 (44%)	50 (42%)	= 120
Long-Term Unemployed	22 (18%)	55 (46%)	43 (36%)	= 120
				Total=420

Number of subjects are given in each of the six cells, with the percentages of each group in parentheses.

TABLE 10

**SUMMARY OF THE NUMBER AND PERCENTAGES OF SUBJECTS
ENDORING
EFFORT AS THE SECOND MOST IMPORTANT THING THEY HAD
LEARNED FROM THE PREVIOUS EMBEDDED FIGURES TASK ITEMS**

	Effort Endorsed	Effort Not Endorsed	Number of Ss Not Answering	Summary of Total Responses
Employed	44 (24%)	86 (48%)	50 (28%)	= 180
Short-Term Unemployed	20 (16%)	50 (42%)	50 (42%)	= 120
Long-Term Unemployed	20 (16%)	43 (36%)	50 (28%)	= 120
				Total=420

* Number of subjects are given in each of the six cells, with the percentages of each group in parentheses.

TABLE 11

SUMMARY OF THE NUMBER AND PERCENTAGES OF SUBJECTS
 ENDORSING DIFFICULTY
 OF THE EMBEDDED FIGURES TASK AS THE REASON FOR THEIR
 PERFORMANCE.

	DIFFICULTY OF EFT ENDORSED	DIFFICULTY OF EFT NOT ENDORSED	NOT NUMBER OF Ss ANSWERING
EMPLOYED	18 (15%)	28 (23%)	47 (26%)
SHORT-TERM UNEMPLOYED	52 (43%)	49 (41%)	82 (46%)
LONG-TERM UNEMPLOYED	50 (42%)	43 (36%)	51 (28%)

* Number of subjects are given in each of the six cells, with the percentages of each group in parentheses.

TABLE 12

PERSISTENCE IN SECONDS
ON EMBEDDED FIGURE TASK ITEMS BY GROUP

SHORT-TERM UNEMPLOYED	LONG-TERM UNEMPLOYED	EMPLOYED
M = 114.12	M = 94.18	M = 100.50
(SD = 60.15)	(SD = 37.16)	(SD = 92.35)

Table 13

**PERSISTENCE ON EMBEDDED FIGURES TASK ITEMS BY
GROUPS AND CONTROL CONDITIONS**

	Mean Number of Seconds	Standard Deviation
Employed No Control	87.00	38.51
Employed Perceived Control	113.99	125.26
Short-Term Unemployed No Control	111.49	60.32
Short-Term Unemployed Perceived Control	116.75	62.54
Long-Term Unemployed No Control	97.15	31.21
Long-Term Unemployed Perceived Control	91.21	43.51

Table 14

**SUMMED SCORES OF THE RESPONSES TO THE
SECOND WAYS OF COPING WITH SUBJECTS
INSTRUCTED TO THINK ABOUT
THE LABORATORY SESSION**

	SHORT-TERM UNEMPLOYED	LONG-TERM UNEMPLOYED	EMPLOYED
PROBLEM SOLVING	549	455	776
SEEKING SOCIAL SUPPORT	171	114	122
SELF BLAME	64	61	72
WISHFUL THINKING	240	139	151
AVOIDANCE	218	142	151

Figure 1
Subject Employment Status

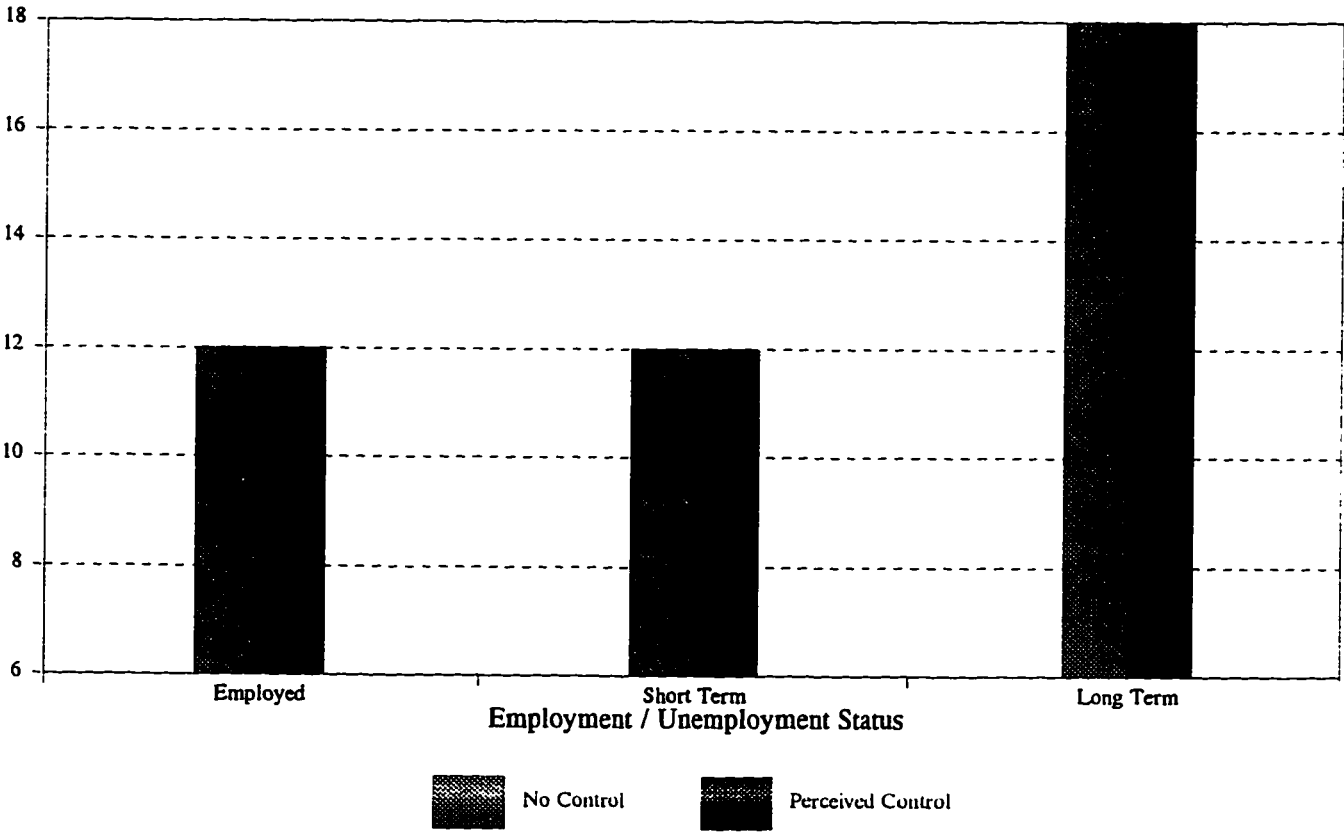


Figure 2
Baseline Blood Pressure and Heart Rate

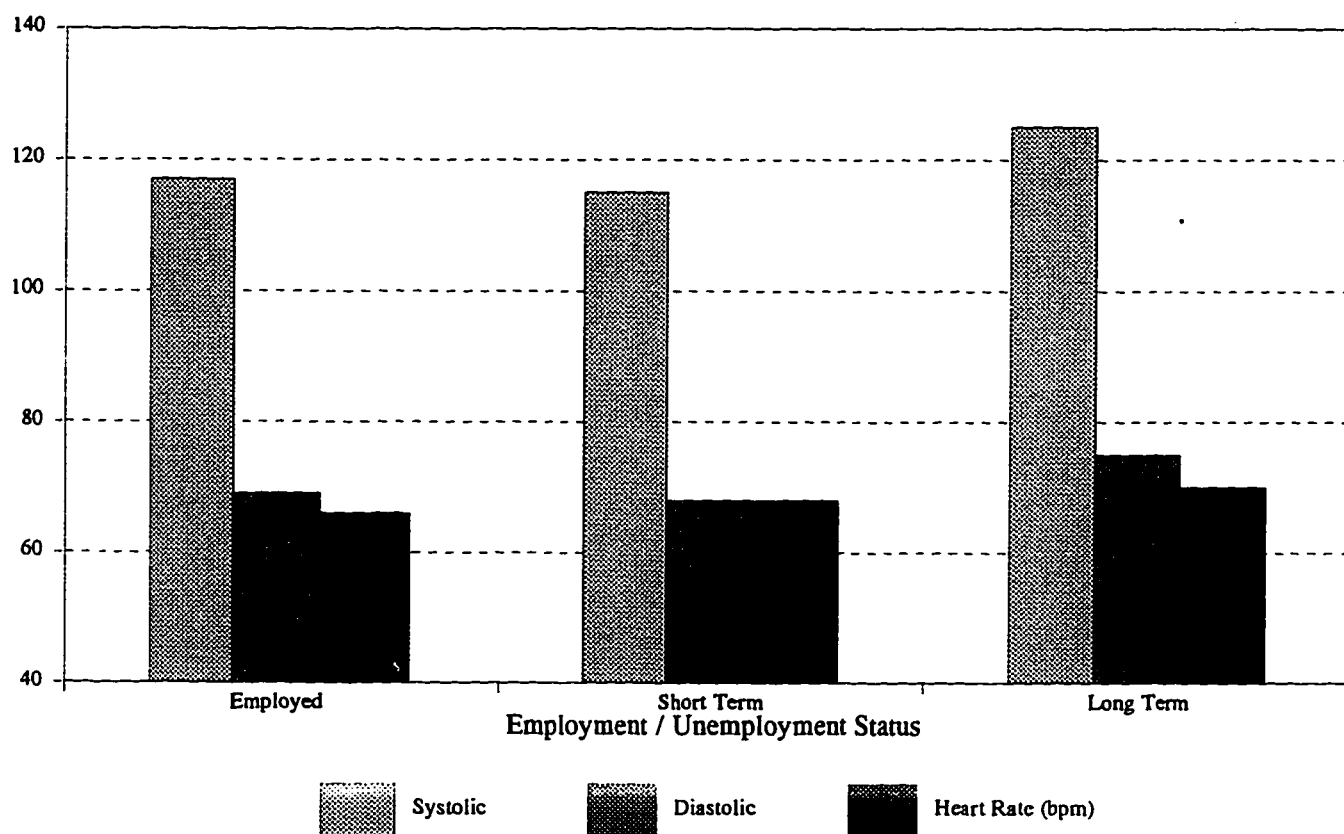


Figure 3
Mean BP & Heart Rate Reading

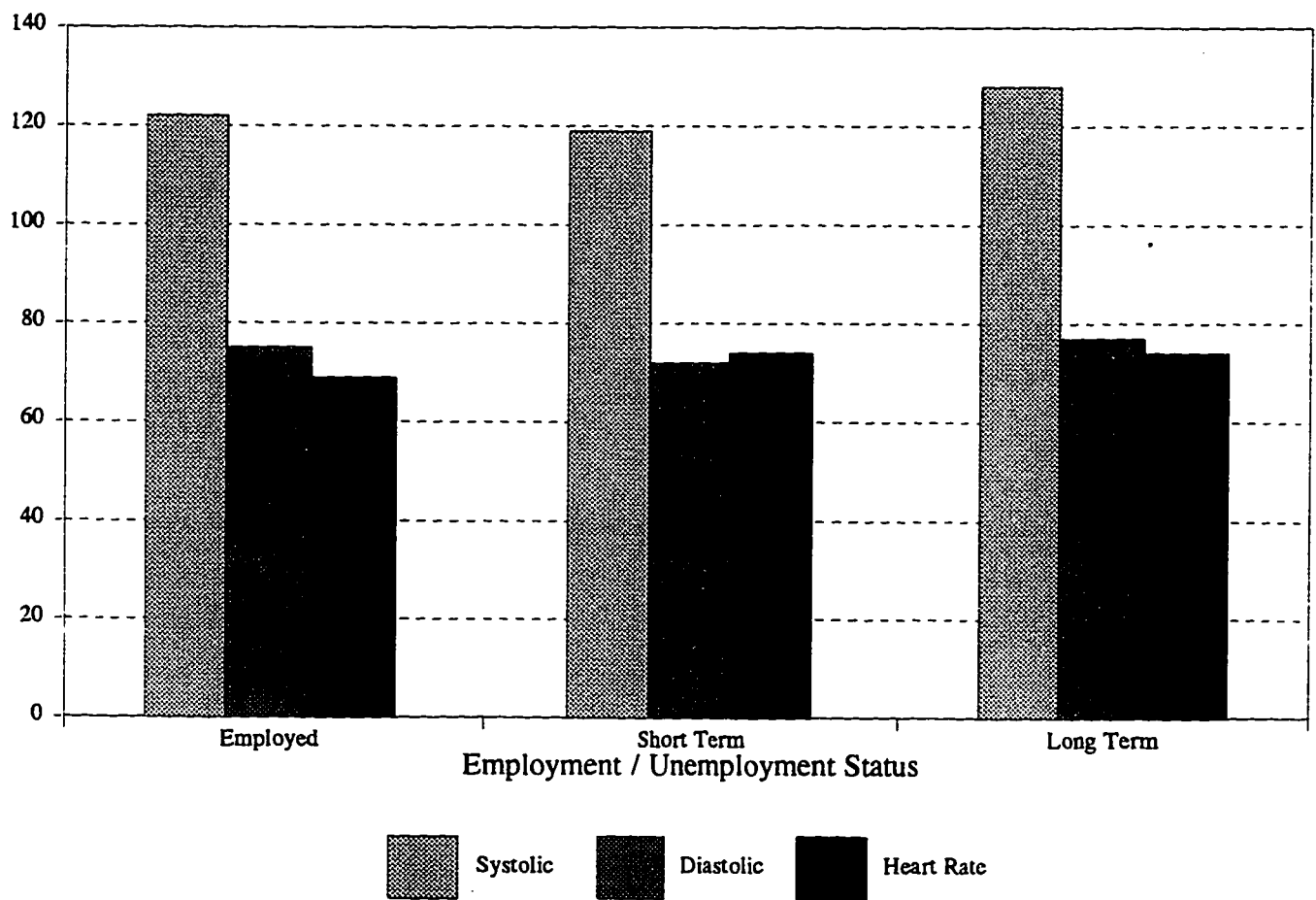
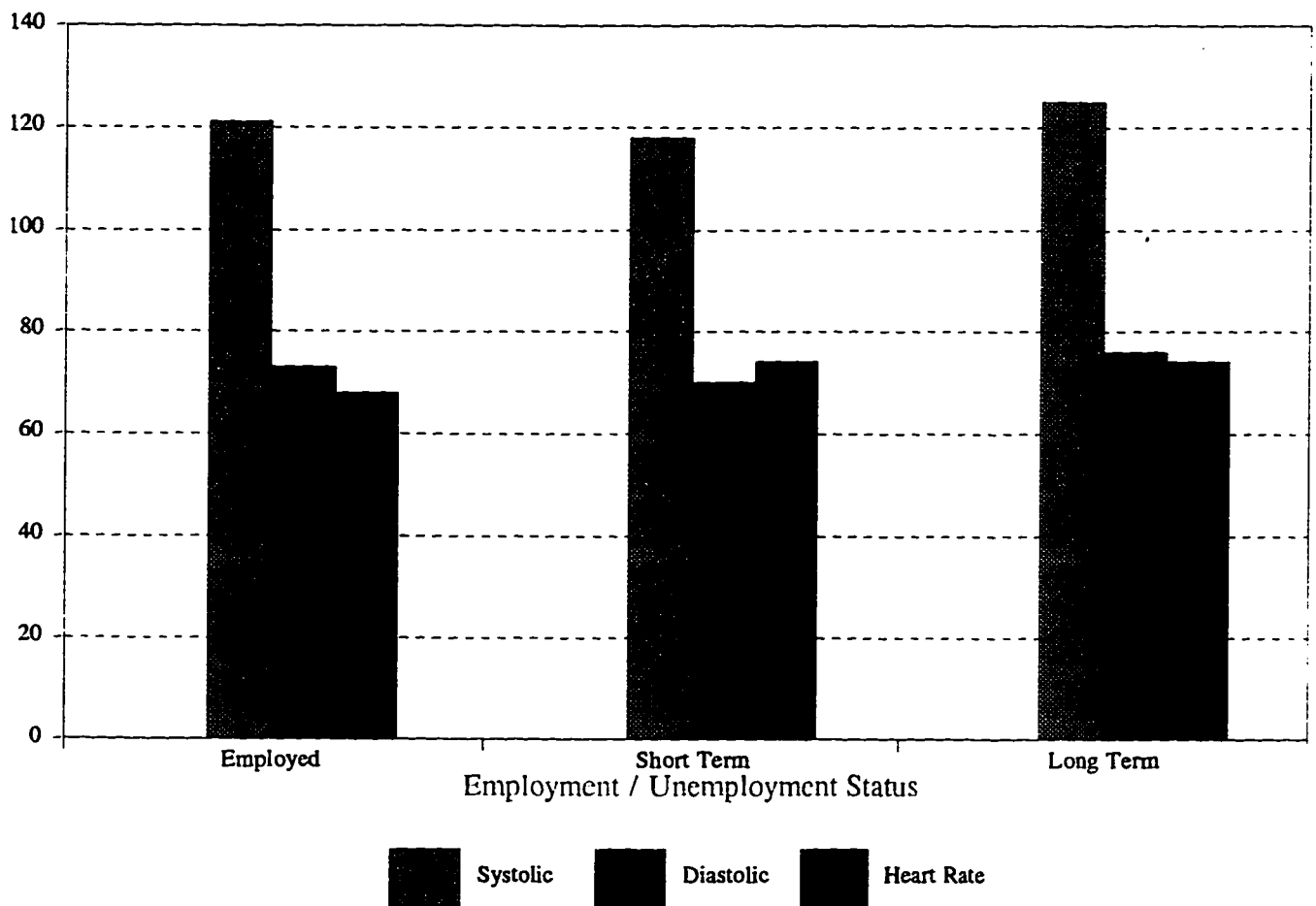


Figure 4
Mean BP & HR Readings Post Stressor



Appendix A

Consent Form



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES
4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4799



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CONSENT FOR RESEARCH PARTICIPATION

- PLEASE READ CAREFULLY -

PROJECT NUMBER C07205-16 ADDENDUM:

STUDY TITLE: The Effects of Noise on Physiological, Behavioral, and Psychological Processes

Background:

This research study is designed to assess behavioral, physiological, and psychological processes during and following exposure to noise. Eighty-four male, unemployed and employed participants will be involved in the study. We will be asking about your attitudes and beliefs on a number of topics and obtaining a general profile on your present well-being. You will be asked to complete a number of questionnaires and to work on several tasks while listening to noise played over speakers similar to those used with home audio equipment. Your blood pressure and heart rate will be monitored periodically. Our specific interest in these processes will be described to you in detail at the end of today's session. There are some aspects of this study you will not be informed of now but will be at the end of the study.

Procedures to be followed:

A monitor that can be set at periodic intervals will be used to obtain heart rate and blood pressure. A cuff attached to the monitor, similar to those used in a doctor's office, will be placed on your arm at the beginning of the session. After relaxing briefly, three consecutive readings will be taken to establish your resting level. During the time you are working on the tasks, readings will be taken at two-minute intervals. Finally, after you have completed all the tasks and again have rested briefly, three additional measures will be taken.

The questionnaires you will be completing are designed to provide us with basic information about yourself, your attitudes, beliefs, and personal characteristics. In addition, a background questionnaire is included to insure those people participating are demographically comparable. Finally, some of the questionnaires will address your feelings and thoughts about the tasks, noise, and the session in general.

The tasks you will be working on will be described to you during the study and will involve problem-solving exercises. The noise you will be listening to while you are working has been previously tested and used extensively in experimental research. It will not, under any circumstances, damage your hearing.

Before the study begins, the experimenter will describe ways in which you can alleviate discomfort due to the inflation of the blood pressure cuff. If, however, for any other reason you become uncomfortable during the study, please tell the experimenter. We do not expect this to occur. But if, for any reason, you feel continuing would constitute a hardship, please tell the experimenter. If you decide to participate and have any questions at any point during the study, we expect you to ask us.

The experimenter may terminate the study session without regard to participant's consent. If this should become necessary, the circumstances and reasons for termination will be explained to you at the end of the study session.

Possible risks or side effects:

The Uniformed Services University of the Health Sciences is a U.S. Government facility. Federal regulations require us to inform you of any risks that may be associated with your participation in this study. This study does not entail any physical or mental risks beyond possible frustration during the problem-solving tasks, possible annoyance due to listening to the noise, and perhaps some minor discomfort when the monitor cuff is inflating during blood pressure and heart rate measurement.

Confidentiality:

Your participation is entirely voluntary and your identity will remain anonymous. Confidentiality will be protected to the best extent provided under law. This consent form and all data collected will be secured in a locked file, and examined only by Dr. Andrew Baum, Dr. Jerome Singer, and Ms. Linda Weiss. Your name, address, and telephone number will not be connected in any way with the information you

provide. A number will be assigned to the questionnaires and tasks you will be completing to insure your anonymity. You will not be identified by name in any publication which may result from this research.

Benefits to you:

The benefits of this study to you will be indirect in that these data will contribute to the research examining the processes involved in response to a variety of social problems. By guaranteeing your anonymity in the manner described above, we will be unable to provide you with any specific information regarding your performance on the tasks or response to the questionnaires.

Compensation:

The study session will last approximately two and a half hours. You will be paid \$30.00 for your participation.

Persons to contact:

If you participate and desire additional information about this experiment, either about the rationale for it or its findings, you may contact Ms. Linda Weiss or Dr. Jerome Singer in the Department of Medical and Clinical Psychology, (301)295-3270. We want your participation in this research study to be an informative and educational experience. We welcome your comments and suggestions, and appreciate your willingness to help us.

YOU ARE MAKING A DECISION WHETHER OR NOT TO PARTICIPATE IN THIS STUDY. YOUR SIGNATURE INDICATES THAT, HAVING READ THE ABOVE INFORMATION, YOU HAVE DECIDED TO PARTICIPATE.

Participant's Signature

Participant's Printed Name

Date

I certify that I have received a copy of this consent form.

Participant's Initials

I WAS PRESENT WHILE THIS VOLUNTEER READ THIS CONSENT FORM AND HAD THE OPPORTUNITY TO ASK QUESTIONS. I HEREBY WITNESS THE VOLUNTEER'S SIGNATURE.

Experimenter's Signature

Experimenter's Printed Name

Date

Appendix B

Social Readjustment Rating Scale (SRRS)

Supplement to the SRRS

Social Support and Control Questionnaire

SCL-90R and Supplement

Ways of Coping

(Instruction Sheets for Employed, Unemployed, and Laboratory Session)
Questionnaires

Job Opportunities and Working Conditions Questionnaire

Appraisal Questionnaire

Background Data Questionnaire

Job Satisfaction Questionnaire

Desire for Control Questionnaire

Debriefing Questions and Comments

RECENT LIFE CHANGES QUESTIONNAIRE

I. Instructions for Marking Your Recent Life Changes

To answer the questions below, mark an "X" in one or more of the columns to the right of each question. If the event in question has occurred to you within the past two years, indicate when it occurred by marking the appropriate column: 0-6 months ago, 7-12 months ago, etc... It may be the case with some of the events below that you experienced them over more than one of the time periods listed for the past two years. If so, mark all the appropriate columns. If the event has not occurred to you during the last two years (or has never occurred to you) leave all the columns empty.

Now go through the questionnaire and mark your recent life changes. The column marked "Your Adjustment Score" will be explained at the end of the questionnaire.

A. HEALTH

	19-24 mos ago	13-18 mos ago	7-12 mos ago	0-6 mos ago	Your Adjustment Score
Within the time periods listed, have you experience:					
1. an illness or injury which:					
(a) kept you in bed for a week or more, or took you to the hospital?	_____	_____	_____	_____	_____
(b) was less serious	_____	_____	_____	_____	_____
2. a major change in eating habits?	_____	_____	_____	_____	_____
3. a major change in sleeping habits?	_____	_____	_____	_____	_____
4. A change in your usual type and/or amount of recreation?	_____	_____	_____	_____	_____
5. major dental work?	_____	_____	_____	_____	_____

19-24
mos ago13-18
mos ago7-12
mos ago0-6
mos agoYour
Adjustment
Score

within the time periods listed, have you:

B. WORK - within the time periods listed have you:

6. changed to a new type of work?	_____	_____	_____	_____	_____
7. Changed your work hours or conditions?	_____	_____	_____	_____	_____
8. had a change in your responsibilities at work?					
(a) more responsibilities?	_____	_____	_____	_____	_____
(b) less responsibilities?	_____	_____	_____	_____	_____
(c) promotion?	_____	_____	_____	_____	_____
(d) transfer?	_____	_____	_____	_____	_____
9. experienced trouble at work?	_____	_____	_____	_____	_____
10. Experienced a major Business readjustment?	_____	_____	_____	_____	_____
11. retired:	_____	_____	_____	_____	_____
12. experienced being:					
(a) fired from work?	_____	_____	_____	_____	_____
(b) laid off from work?	_____	_____	_____	_____	_____
13. taken courses by mail or studied at home to help you in your work?	_____	_____	_____	_____	_____
C. HOME AND FAMILY					
14. a change in residence:					
(a) a move within the same town or city?	_____	_____	_____	_____	_____
(b) a move to a different town, city or state?	_____	_____	_____	_____	_____
15. a change in family "get-togethers"?	_____	_____	_____	_____	_____
16. a major change in the health or behavior of a family member (illnesses, accidents, drug or disciplinary problems, etc)?	_____	_____	_____	_____	_____

	19-24 mos ago	13-18 mos ago	7-12 mos ago	0-6 mos ago	Your Adjustment Score
within the time periods listed, have you experienced:					
18. the death of a spouse?	_____	_____	_____	_____	_____
19. the death of a:					
(a) child?	_____	_____	_____	_____	_____
(b) brother or sister?	_____	_____	_____	_____	_____
(c) parent?	_____	_____	_____	_____	_____
(d) other close family member?	_____	_____	_____	_____	_____
20. the death of a close friend?	_____	_____	_____	_____	_____
21. a change in the marital status of your parents?					
(a) divorce?	_____	_____	_____	_____	_____
(b) remarriage?	_____	_____	_____	_____	_____

NOTE: QUESTIONS 22-23 CONCERN MARRIAGE. FOR PERSONS NEVER MARRIED,
GO TO ITEM 34.

22. marriage?	_____	_____	_____	_____	_____
23. a change in arguments with your spouse?	_____	_____	_____	_____	_____
24. in-law problems?	_____	_____	_____	_____	_____
25. a separation from spouse:					
(a) due to work?	_____	_____	_____	_____	_____
(b) due to marital problems?	_____	_____	_____	_____	_____
26. a reconciliation with spouse?	_____	_____	_____	_____	_____
27. a divorce?	_____	_____	_____	_____	_____
28. a gain of a new family member:					
(a) birth of a child?	_____	_____	_____	_____	_____
(b) adoption of a child?	_____	_____	_____	_____	_____
(c) a relative moving in with you?	_____	_____	_____	_____	_____
29. spouse beginning or ceasing work outside the home?	_____	_____	_____	_____	_____

	19-24 mos ago	13-18 mos ago	7-12 mos ago	0-6 mos ago	Your Adjustment Score
within the time periods listed, have you experienced:					
30. wife (or self) becoming pregnant?	_____	_____	_____	_____	_____
31. a child leaving home:					
(a) due to marriage?	_____	_____	_____	_____	_____
(b) to attend college?	_____	_____	_____	_____	_____
(c) for other reasons?	_____	_____	_____	_____	_____
32. Wife or (self) having a miscarriage or an abortion?	_____	_____	_____	_____	_____
33. birth of a grandchild?	_____	_____	_____	_____	_____

PERSONAL AND SOCIAL - WITHIN THE TIME PERIODS LISTED, HAVE YOU EXPERIENCED:

34. a major personal achievement?	_____	_____	_____	_____	_____
35. a change in your personal habits (your dress, friends life-style, etc.)?	_____	_____	_____	_____	_____
36. sexual difficulties?	_____	_____	_____	_____	_____
37. beginning or ceasing school or college?	_____	_____	_____	_____	_____
38. a change of school or college?	_____	_____	_____	_____	_____
39. a vacation?	_____	_____	_____	_____	_____
40. a change in your religious beliefs?	_____	_____	_____	_____	_____
41. a change in your social activities (clubs, movies, visiting)?	_____	_____	_____	_____	_____
42. a minor violation of the law?	_____	_____	_____	_____	_____
43. legal troubles resulting in your being held in jail?	_____	_____	_____	_____	_____

	19-24 mos ago	13-18 mos ago	7-12 mos ago	0-6 mos ago	Your Adjustment Score
within the time periods listed, have you experienced:					
44. a change in your political beliefs?	_____	_____	_____	_____	_____
45. a new, close, personal relationship?	_____	_____	_____	_____	_____
46. An engagement to marry?	_____	_____	_____	_____	_____
47. a "falling out" of a close personal relationship?	_____	_____	_____	_____	_____
48. girlfriend (or boyfriend) problems?	_____	_____	_____	_____	_____
49. a loss or damage of personal property?	_____	_____	_____	_____	_____
50. an accident?	_____	_____	_____	_____	_____
51. a major decision regarding your immediate future?	_____	_____	_____	_____	_____

E. FINANCIAL - WITHIN THE TIME PERIODS LISTED, HAVE YOU:

52. taken on a moderate purchase, such as a TV, car, freezer?	_____	_____	_____	_____	_____
53. taken on a major purchase or a mortgage loan, such as a home, business, property?	_____	_____	_____	_____	_____
54. experienced a foreclosure on a mortgage or loan?	_____	_____	_____	_____	_____
55. experienced a major change in finances:					
(a) increased income?	_____	_____	_____	_____	_____
(b) decreased income?	_____	_____	_____	_____	_____
(c) credit rating difficulties?	_____	_____	_____	_____	_____

INSTRUCTIONS FOR SCORING YOUR ADJUSTMENT TO YOUR RECENT LIFE CHANGES

Persons adapt to their recent life changes in different ways. Some people find the adjustment to a residential move, for example, to be enormous, while others find very little life adjustment necessary. You are now requested to "score" each of the recent life changes that you marked with an "X" as to the amount of adjustment you needed to handle the event.

Your scores can range from 1 to 100 "points." If, for example, you experienced a recent residential move but felt it required very little life adjustment, you would choose a low number and place it in the blank to the right of the question's box. On the other hand, if you recently changed residence and felt it required a near maximal life adjustment, you would place a high number, toward 100, in the blank to the right of the question's box. For intermediate life adjustment scores you would choose intermediate numbers between 1 and 100.

Please go back through your questionnaire and for each recent life change you indicated with an "X," choose your personal life change adjustment score (between 1 and 100) which reflects what you saw to be the amount of life adjustment necessary to cope with or handle the event. Use both your estimates of the intensity of the life change and its duration to arrive at your scores.

S#: _____

LIFE EVENTS SUPPLEMENTAL FORM

This form lists all the Life Changes listed in the previous questionnaire under the major sections of **HEALTH, HOME AND FAMILY, MARRIAGE, AND PERSONAL & SOCIAL**. Questions 6 through 13 have been omitted. Please go back to each event you have experienced during the past two years and rate how much you feel that event was related to your job if you are currently employed. If you are unemployed, please indicate how much you feel the event is related to your being out of work.

1a. An illness or injury which kept you in bed a week or more, or took you to the hospital?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

1b. An illness or injury which was less serious than described above?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

2. A major change in eating habits?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

3. A major change in sleeping habits?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

4. A change in your usual type and/or amount of recreation?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

S#: _____

5. Major dental work?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

****PLEASE SKIP THE EVENTS 6 THROUGH 13 - SINCE ALL OF THESE ARE
WORK-RELATED****

14. Have you experienced a change in residence:

(a) a move within the same town or city?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(b) a move to a different town, city, or state?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

15. A change in family "get-togethers"?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

16. A major change in the health or behavior of a family member illness, accidents, drug or disciplinary problems, etc.)?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

****QUESTION 17 IS NOT ON THIS QUESTIONNAIRE****

S#: _____

18. The death of a spouse?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

19. The death of a:
(a) child?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(b) the death of a brother or sister?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(c) the death of a parent?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(d) the death of another close family member?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

20. The death of a close friend?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

S#: _____

21. A change in the marital status of your parents:

(a) divorce?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

(b) marriage?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

22. A change in your marriage?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

23. A change in arguments with your spouse?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

24. In-law problems?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

25. A separation from spouse:

(a) due to work?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

S#: _____

(b) due to marital problems?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

26. A reconciliation with spouse?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

27. A divorce?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

28. A gain of a new family member?

(a) birth of a child?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(b) adoption of a child?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(c) a relative moving in with you?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

29. Spouse beginning or ceasing work outside the home?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

S#: _____

30. Wife becoming pregnant?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

31. A child leaving home:
(a) due to marriage?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(b) to attend college?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(c) for other reasons?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

32. Wife having a miscarriage or an abortion?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

33. Birth of a grandchild?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

S#: _____

34. A major personal achievement?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

35. A change in your personal habits (your dress, friends, life-style, etc.)?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

36. Sexual difficulties?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

37. Beginning or ceasing school or college?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

38. A change in school or college?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

S#: _____

39. A vacation?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

40.. A change in your religious beliefs?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

41. A change in your social activities (clubs, movies, visiting)?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

42. A minor violation of the law?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

43. Legal troubles resulting in your being held in jail?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

S#: _____

44. A change in your political beliefs?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

45. A new, close, personal relationship?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

46. An engagement to marry?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

47. A "falling out" of a close personal relationship?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

48. Girlfriend problems?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

S#: _____

49. A loss or damage of personal property?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

50. An accident?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

51. A major decision regarding your immediate future?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

52. Taken on a moderate purchase, such as a TV, car, freezer?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

53. Taken on a major purchase or a mortgage loan, such as a home, business, property?

1	2	3	4	5
Very Related	Somewhat Related	Unsure	Somewhat Unrelated	Very Unrelated

S#: _____

54. Experienced a foreclosure on a mortgage or loan?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

55. Experienced a major change in finances:

(a) increased income?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(b) decreased income?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

(c) credit rating difficulties?

1	2	3	4	5
Very	Somewhat	Unsure	Somewhat	Very
Related	Related		Unrelated	Unrelated

S#: _____

Please rate the degree to which you agree or disagree with the following statements. If you agree strongly, you might pick "1", if you agree, but not strongly, you might pick "2" or "3". If you disagree, you would pick "5", "6", or "7", depending on how strongly you disagree. If you don't really agree or disagree, you would pick "4".

	Agree Strongly					Disagree Strongly	
1. I often feel lonely, like I don't have anyone to reach out to.	1	2	3	4	5	6	7
2. When I am unhappy or under stress there are people I can turn to for support.	1	2	3	4	5	6	7
3. I don't know anyone to confide in	1	2	3	4	5	6	7
4. I used to have close friends to talk to about things, but I don't anymore.	1	2	3	4	5	6	7
5. When I am troubled, I keep things to myself.	1	2	3	4	5	6	7
6. I am not a member of any social groups (such as church groups, clubs, teams, etc...).	1	2	3	4	5	6	7
7. It is often not worth the effort to try to change the way things are.	1	2	3	4	5	6	7
8. I think that one can control what happens to him/her.	1	2	3	4	5	6	7
9. In (my home/the home) it is easy to predict what will happen.	1	2	3	4	5	6	7
10. In my life, in general, I think it is worthwhile to try to affect the way things are.	1	2	3	4	5	6	7
11. There is no point in trying to regulate contact with people in (this/my) home.	1	2	3	4	5	6	7

INSTRUCTIONS:

Below is a list of problems and complaints that people sometimes have. Please read each one carefully. After you have done so, please fill in one of the numbered circles to the right that best describes HOW MUCH DISCOMFORT THAT PROBLEM HAS CAUSED YOU DURING THE PAST WEEK INCLUDING TODAY. Mark only one numbered circle for each problem and do not skip any items. If you change your mind, erase your first mark carefully. Read the example below before beginning, and if you have any questions please ask the technician.

SEX

MALE

☐

FEMALE

☐

NAME: _____

LOCATION: _____

EDUCATION: _____

MARITAL STATUS: MAR. _____ SEP. _____ DIV. _____ WID. _____ SING. _____

DATE

MO	DAY	YEAR

ID.

NUMBER

--	--	--	--

AGE

--	--

EXAMPLE

HOW MUCH WERE YOU DISTRESSED BY:

NOT AT ALL
A LITTLE BIT
MODERATELY
QUITE A BIT
EXTREMELY

1. Bodyaches

①	②	③	④	⑤
---	---	---	---	---

VISIT NUMBER: _____

HOW MUCH WERE YOU DISTRESSED BY:

NOT AT ALL
A LITTLE BIT
MODERATELY
QUITE A BIT
EXTREMELY

1. Headaches
2. Nervousness or shakiness inside
3. Repeated unpleasant thoughts that won't leave your mind
4. Faintness or dizziness
5. Loss of sexual interest or pleasure
6. Feeling critical of others
7. The idea that someone else can control your thoughts
8. Feeling others are to blame for most of your troubles
9. Trouble remembering things
10. Worried about sloppiness or carelessness
11. Feeling easily annoyed or irritated
12. Pains in heart or chest
13. Feeling afraid in open spaces or on the streets
14. Feeling low in energy or slowed down
15. Thoughts of ending your life
16. Hearing voices that other people do not hear
17. Trembling
18. Feeling that most people cannot be trusted
19. Poor appetite
20. Crying easily
21. Feeling shy or uneasy with the opposite sex
22. Feelings of being trapped or caught
23. Suddenly scared for no reason
24. Temper outbursts that you could not control
25. Feeling afraid to go out of your house alone
26. Blaming yourself for things
27. Pains in lower back
28. Feeling blocked in getting things done
29. Feeling lonely
30. Feeling blue
31. Worrying too much about things
32. Feeling no interest in things
33. Feeling fearful
34. Your feelings being easily hurt
35. Other people being aware of your private thoughts

1	①	②	③	④
2	①	②	③	④
3	①	②	③	④
4	①	②	③	④
5	①	②	③	④
6	①	②	③	④
7	①	②	③	④
8	①	②	③	④
9	①	②	③	④
10	①	②	③	④
11	①	②	③	④
12	①	②	③	④
13	①	②	③	④
14	①	②	③	④
15	①	②	③	④
16	①	②	③	④
17	①	②	③	④
18	①	②	③	④
19	①	②	③	④
20	①	②	③	④
21	①	②	③	④
22	①	②	③	④
23	①	②	③	④
24	①	②	③	④
25	①	②	③	④
26	①	②	③	④
27	①	②	③	④
28	①	②	③	④
29	①	②	③	④
30	①	②	③	④
31	①	②	③	④
32	①	②	③	④
33	①	②	③	④
34	①	③	③	④
35	①	②	③	④

HOW MUCH WERE YOU DISTRESSED BY:		NOT AT ALL	A LITTLE BIT	MODERATELY	QUITE A BIT	EXTREMELY	
36.	Feeling others do not understand you or are unsympathetic	36	0	1	2	3	4
37.	Feeling that people are unfriendly or dislike you	37	0	1	2	3	4
38.	Having to do things very slowly to insure correctness	38	0	1	2	3	4
39.	Heart pounding or racing	39	0	1	2	3	4
40.	Nausea or upset stomach	40	0	1	2	3	4
41.	Feeling inferior to others	41	0	1	2	3	4
42.	Soreness of your muscles	42	0	1	2	3	4
43.	Feeling that you are watched or talked about by others	43	0	1	2	3	4
44.	Trouble falling asleep	44	0	1	2	3	4
45.	Having to check and double-check what you do	45	0	1	2	3	4
46.	Difficulty making decisions	46	0	1	2	3	4
47.	Feeling afraid to travel on buses, subways, or trains	47	0	1	2	3	4
48.	Trouble getting your breath	48	0	1	2	3	4
49.	Hot or cold spells	49	0	1	2	3	4
50.	Having to avoid certain things, places, or activities because they frighten you	50	0	1	2	3	4
51.	Your mind going blank	51	0	1	2	3	4
52.	Numbness or tingling in parts of your body	52	0	1	2	3	4
53.	A lump in your throat	53	0	1	2	3	4
54.	Feeling hopeless about the future	54	0	1	2	3	4
55.	Trouble concentrating	55	0	1	2	3	4
56.	Feeling weak in parts of your body	56	0	1	2	3	4
57.	Feeling tense or keyed up	57	0	1	2	3	4
58.	Heavy feelings in your arms or legs	58	0	1	2	3	4
59.	Thoughts of death or dying	59	0	1	2	3	4
60.	Overeating	60	0	1	2	3	4
61.	Feeling uneasy when people are watching or talking about you	61	0	1	2	3	4
62.	Having thoughts that are not your own	62	0	1	2	3	4
63.	Having urges to beat, injure, or harm someone	63	0	1	2	3	4
64.	Awakening in the early morning	64	0	1	2	3	4
65.	Having to repeat the same actions such as touching, counting, or washing	65	0	1	2	3	4
66.	Sleep that is restless or disturbed	66	0	1	2	3	4
67.	Having urges to break or smash things	67	0	1	2	3	4
68.	Having ideas or beliefs that others do not share	68	0	1	2	3	4
69.	Feeling very self-conscious with others	69	0	1	2	3	4
70.	Feeling uneasy in crowds, such as shopping or at a movie	70	0	1	2	3	4
71.	Feeling everything is an effort	71	0	1	2	3	4
72.	Spells of terror or panic	72	0	1	2	3	4
73.	Feeling uncomfortable about eating or drinking in public	73	0	1	2	3	4
74.	Getting into frequent arguments	74	0	1	2	3	4
75.	Feeling nervous when you are left alone	75	0	1	2	3	4
76.	Others not giving you proper credit for your achievements	76	0	1	2	3	4
77.	Feeling lonely even when you are with people	77	0	1	2	3	4
78.	Feeling so restless you couldn't sit still	78	0	1	2	3	4
79.	Feelings of worthlessness	79	0	1	2	3	4
80.	The feeling that something bad is going to happen to you	80	0	1	2	3	4
81.	Shouting or throwing things	81	0	1	2	3	4
82.	Feeling afraid you will faint in public	82	0	1	2	3	4
83.	Feeling that people will take advantage of you if you let them	83	0	1	2	3	4
84.	Having thoughts about sex that bother you a lot	84	0	1	2	3	4
85.	The idea that you should be punished for your sins	85	0	1	2	3	4
86.	Thoughts and images of a frightening nature	86	0	1	2	3	4
87.	The idea that something serious is wrong with you body	87	0	1	2	3	4
88.	Never feeling close to another person	88	0	1	2	3	4
89.	Feelings of guilt	89	0	1	2	3	4
90.	The idea that something is wrong with your mind	90	0	1	2	3	4

SCL-90-R additional questions

How much have you been distressed by:

	not at all	a little bit	moderately	quite a bit	extremely
91. Feelings of helplessness					
92. Having to avoid people					
93. Feelings of it not mattering when given choices					
94. Felling like you really don't care whether you do one thing or another					
95. Sudden noises making you jump or shake badly					

S#: _____

The following is a list of possible ways of dealing with a stressful situation. Each of the thoughts and behaviors listed may be like the ways in which people feel and behave when they experience stress. Please think about a major stressful event which has occurred in your life DURING THE PAST YEAR. Please list it here:

We are interested in the degree to which you have felt or used each of the thoughts or behaviors described in these items to deal with this situation. Please check the appropriate column to indicate whether the thought or behavior was one that you: never used or felt; rarely used or felt; sometimes used or felt; or, regularly used or felt.

On the last page there are 14 statements using a slightly different response format. Please answer these statements while thinking about the stressful event you listed above.

S#: _____

The following is a list of possible ways of dealing with a stressful situation. Each of the thoughts or behaviors listed may be like the ways in which people feel and behave when they experience stress. When responding to the following list please think about:

BEING UNEMPLOYED

We are interested in the degree to which you have felt or used each of the thoughts or behaviors described in these items to deal with this situation. Please check the appropriate column to indicate whether the thought or behavior was or is one that you: never used or felt; rarely used or felt; sometimes used or felt; or, regularly used or felt.

On the last page there are 14 statements using a slightly different response format. Please answer these statements while thinking about:

THOUGHTS / BEHAVIORS	never used	rarely used	sometimes used	regularly used
1. Bargained or compromised to get something positive from the situation.				
2. Talked to someone to find out about the situation.				
3. Blamed yourself.				
4. Concentrated on something good that could come out of the whole thing.				
5. Criticized or lectured yourself.				
6. Tried not to burn bridges behind me, but left things open somewhat.				
7. Hoped a miracle would happen.				
8. Asked someone I respected for advice and followed it.				
9. Kept others from knowing how bad things were.				
10. Talked to someone about how I was feeling.				
11. Stood my ground and fought for what I wanted.				
12. Just took things one step at a time.				
13. I knew what had to be done, so I doubled my efforts and tried harder to make things work.				
14. Refused to believe that it had happened.				

THOUGHTS / BEHAVIORS	never used	rarely used	sometimes used	regularly used
15. Came up with a couple of different solutions to the problem.				
16. Wished I were a stronger person--more optimistic and forceful.				
17. Accepted my strong feelings, but didn't let them interfere with other things too much.				
18. Wished that I could change what had happened.				
19. Wished that I could change the way I felt				
20. Changed something about myself so that I could deal with the situation better.				
21. Daydreamed or imagined a better time or place than the one I was in.				
22. Had fantasies or wished about how things might turn out.				
23. Thought about fantastic or unreal things (like the perfect revenge or finding a million dollars) that made me feel better.				
24. Wished that the situation would go away or somehow be finished.				
25. Went on as if nothing had happened.				
26. Felt bad that I couldn't avoid the problem.				
27. Kept my feelings to myself.				
28. Slept more than usual.				

THOUGHTS / BEHAVIORS	never used	rarely used	sometimes used	regularly used
29. Got mad at the people or things that caused the problem.				
30. Accepted sympathy and understanding from someone.				
31. Tried to forget the whole thing.				
32. Got professional help and did what they recommended.				
33. Changed or grew as a person in a good way.				
34. Made a plan of action and followed it				
35. Accepted the next best thing that I wanted.				
36. Realized that I brought the problem on myself.				
37. Came out of the the experience better than when I went in.				
38. Talked to someone who could do something concrete about the problem.				
39. Tried to make myself feel better by eating, drinking, smoking,taking medication etc.				
40. Tried not to act too hastily or follow my own hunch.				
41. Changed something so things would turn out all right.				
42. Avoided being with people in general.				

In response to the following question, please check the degree to which the statements below apply to the stressor that was listed on page 1.

" In general, the stressor listed on page 1 is one that ":

	strongly disagree	disagree	both agree and disagree	agree	strongly agree
1. ... I can change or do something about.					
2. ... I must accept or get used to.					
3. ... I need to know more about before I can act.					
4. ... requires that I hold myself back from doing what I want to do.					
5. ... is very important to me.					
6. ... I have some control over.					
7. ... will be resolved in one year.					
8. ... will be resolved in 4 years.					
9. ... I think about often.					
10. ... will always be a problem in my life.					
11. ... is very threatening.					
12. ... I have experienced before.					
13. ... is ambiguous.					
14. ... is the result of my own shortcomings.					

The following is the list of possible ways of dealing with a stressful situation you completed earlier during this session. Again, each of the thoughts or behaviors listed may be like the ways in which people feel and behave when they experience stress. Please think about:

THE LABORATORY SESSION YOU HAVE JUST COMPLETED

We are interested in the degree to which you have felt or used each of the thoughts or behaviors described in these items to deal with this situation. Please check the appropriate column to indicate whether the thought or behavior was one that you: never used or felt, rarely used or felt, sometimes used or felt, or regularly used or felt.

Again, on the last page there are 14 statements using a slightly different response format. Please answer these statements while thinking about:

THE LABORATORY SESSION YOU HAVE JUST COMPLETED

THE RESPONSE SET FOR THE SECOND ADMINISTRATION OF
THE WAYS OF COPING
IS IDENTICAL TO PP.170-174

S#: _____

This questionnaire is a series of statements about job opportunities, working conditions and other related issues. Please circle the number below the following sentences that best describes your agreement or disagreement with each statement.

1. Some people seem to tolerate noise. I'm not one of those people.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

2. There are a lot of jobs available in the U.S. - anyone who really wants to work can.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

3. The U.S. offers many training or educational services that are fairly inexpensive to help people find jobs.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

4. Being unemployed can make a person feel helpless about the future.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

5. I don't mind being interrupted while I'm working, it breaks up the daily routine.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

6. Even if you are repeatedly unsuccessful in getting a job, the search process teaches you valuable skills you can use in filling out your next application or during future interviews.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

S#: _____

7. Working is more than just financially rewarding, it gives me a sense of being in charge of my life.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
8. Education is the key to success in the job market.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
9. Finding a good job is a matter of being at the right place at the right time.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
10. Noisy work conditions make me irritable or edgy.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
11. I believe that I have the ability to change the negative things that affect my life.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
12. If I apply for a job but am not hired, I'm more likely to blame myself rather than the company or the person who interviewed me.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
13. The current administration has made significant economic changes that will positively affect the job market.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |

S#: _____

14. It may take some time but I seem to be lucky when it comes to finding the right job for me.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

15. Being exposed to constant noise has both physical and emotional effects.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

16. Being unemployed is like other life crises, the best thing you can do is learn to accept the way things are.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

17. Looking for a job is challenging.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

18. Most women who hold managerial positions are as knowledgeable and responsible as men holding the same type of position.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

19. I often get headaches at work.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

20. It often seems like I'm at the mercy of my surroundings (environment) including the people in it.

1	2	3	4	5
Strongly Agree	Moderately Agree	Unsure	Moderately Disagree	Strongly Disagree

S#: _____

21. Looking for a job can be very frustrating. Being turned down time after time just makes you want to stop trying.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
22. There is no such thing as "job security" these days. Cut-backs place everyone at risk of losing their job.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
23. When I'm working I can "tune out" other people and other sources of noise.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |
24. My skills and work experience are valuable assets.
- | | | | | |
|----------------|------------------|--------|---------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Strongly Agree | Moderately Agree | Unsure | Moderately Disagree | Strongly Disagree |

Subject #: _____

Before beginning work on the tasks and listening to the noise, we would like you to answer the following questions. Some may seem strange or may be difficult to answer, but please answer each one.

The following questions ask about your thoughts and how you are feeling about working on the tasks while you are listening to the noise. Please circle the number that best describes how you are feeling or your thoughts about the testing session.

1. The tasks and noise will not bother me because I think I can handle the situation.

1	2	3	4	5	6	7
Not true at all						Very True

2. I feel uncomfortable about the task and noise session.

1	2	3	4	5	6	7
Not true at all						Very True

3. I think I can find a way to do well during the task and noise session.

1	2	3	4	5	6	7
Not true at all						Very True

4. The task and noise session will be challenging but I am not overly concerned about it.

1	2	3	4	5	6	7
Not true at all						Very True

5. The task and noise session is somewhat threatening.

1	2	3	4	5	6	7
Not true at all						Very True

6. I do not think I am going to have much control over how well I do on the tasks during the noise session.

1	2	3	4	5	6	7
Not true at all						Very True

S#: _____

BACKGROUND DATA

1. How would you characterize where you live now:

☐ Rural Community
☐ Small Town
☐ Suburban Neighborhood
☐ Urban Neighborhood
☐ Other (specify) _____

2. How long have you lived at your present residence? _____

3. What is your marital status?

☐ Single
☐ Married
☐ Separated
☐ Divorced
☐ Widowed
☐ Other (specify) _____

4. Number of people living at your residence _____

Are any of these people anything other than relatives?

☐ Yes☐ No

If yes, specify relationship. _____

5. Type of residence:

☐ Apartment
☐ Single family home
☐ Two family home
☐ Three family home
☐ Townhouse
☐ Other (specify) _____

6. Do you own or rent? _____

S#: _____

7. How many people (other than yourself) rely on you for financial support? _____
 Are any of these people not immediate family members (i.e. spouse or children)? _____ Yes _____ No
 If yes, specify relationship _____

8. Were you born in the United States? _____ Yes _____ No
 If no, are you a U.S. citizen? _____ Yes _____ No
 If no, are you a permanent resident? _____ Yes _____ No
 If no, please specify: _____

9. Are you currently employed? _____ Yes _____ No

10. Please describe your most recent or current occupation:

11. What is your personal approximate annual income this year:

_____ Under \$5,000 per year
 _____ \$ 5,000 - \$10,000 per year
 _____ \$10,000 - \$15,000 per year
 _____ \$15,000 - \$20,000 per year
 _____ \$20,000 - \$30,000 per year
 _____ \$30,001 - \$40,000 per year
 _____ \$40,001 - \$50,000 per year
 _____ over \$50,000 per year

12. What is your household approximate annual income this year:

_____ Under \$5,000 per year
 _____ \$ 5,001 - \$10,000 per year
 _____ \$10,001 - \$15,000 per year
 _____ \$15,001 - \$20,000 per year
 _____ \$20,001 - \$30,000 per year
 _____ \$30,001 - \$40,000 per year
 _____ \$40,001 - \$50,000 per year
 _____ \$50,001 - \$60,000 per year
 _____ \$60,001 - \$70,000 per year
 _____ \$70,001 - \$80,000 per year
 _____ \$80,001 - \$90,000 per year
 _____ \$90,001 - \$99,999 per year
 _____ over \$100,000 per year

13. Please check all of the sources that currently contribute to your household income:

☐ My full-time job income
☐ My part-time job income
☐ Spouse's full-time job income
☐ Spouse's part-time job income
☐ Other family members' income
☐ Disability benefits
☐ Investment income
☐ Alimony income
☐ Child support
☐ Unemployment benefits
☐ Government financial assistance
☐ Other (please specify) _____

14. Your age: _____

15. Date of Birth: _____-_____-_____

16. Would you describe yourself as:

☐ Asian
☐ Black
☐ Caucasian (White)
☐ Hispanic
☐ Native American
☐ Other (specify) _____

17. Your highest educational level:

<input type="checkbox"/> Elementary school	<input type="checkbox"/> Junior College degree
<input type="checkbox"/> Junior high school	<input type="checkbox"/> Bachelor's degree
<input type="checkbox"/> High school diploma	<input type="checkbox"/> Some graduate work
<input type="checkbox"/> GED diploma	<input type="checkbox"/> Master's degree
<input type="checkbox"/> Technical school	<input type="checkbox"/> Ph.D.
<input type="checkbox"/> Some college	
<input type="checkbox"/> Other (specify) _____	

18. Are you currently enrolled as a student? ☐ Yes ☐ No
 If yes, describe level from #17: _____

S#: _____

19. How often do you exercise?

☐ Never☐ Rarely☐ 1 to 2 times a month☐ 2 to 3 times a week☐ Once a week☐ Every other day☐ Daily

20. If you exercise, what types of exercise do you do?

S#: _____

21. FOR UNEMPLOYED PARTICIPANTS ONLY. AS OF TODAY I HAVE
BEEN UNEMPLOYED FOR:

_____ Less than 1 week

_____ 1 - 3 weeks

_____ 4 - 6 weeks

_____ 7 - 9 weeks

_____ 13 - 15 weeks

_____ 4 - 6 months

_____ 7 - 12 months

_____ 1 - 2 years

DIRECTIONS:

Answer each of the following questions based on the scale provided with each questions (1 - 4, 1 - 7, etc...)

If you are not employed outside the home, but do work as a homemaker, please answer the questions with regard to that work.

1. How often are you bothered by each of the following in your work?
(1=not at all, 2=rarely, 3=sometimes, 4=rather often, 5=nearly all the time)
 - a. ___ Feeling you have too much responsibility for the work of others.
 - b. ___ Having to do or decide things where mistakes could be quite costly.
 - c. ___ Not having enough help or equipment to get the job done well.
 - d. ___ Thinking that the amount of work you have to do may interfere with how well it gets done.
 - e. ___ Feeling that you have to do things that are against your better judgement.
 - f. ___ Feeling unable to influence your immediate supervisor's decisions and actions that affect you.
 - h. ___ Not knowing what the people you work with expect of you.
 - i. ___ Having to deal with or satisfy too many people.
 - k. ___ Being asked to work overtime when you don't want to.
 - l. ___ Feeling trapped in a job you don't like but can't get out of.

2. How often are you bothered by each of the following in work?
(1=never, 2=rarely, 3=sometimes, 4=fairly often, 5=very often)
 - a. ___ How often does your job require you to work very fast?
 - b. ___ How often does your job require you to work very hard (physically or mentally)?
 - c. ___ How often does your job leave you with little time to get everything done?

(Continued on next page)

3. Please indicate how true each of the following statements is of you. Answer as quickly as you can, because your first impressions are most important. (1-"bit at all true of me" <----> 7 = "very true of me").
- ☐ Sometimes I feel I shouldn't be working so hard, but something drives me on.
 - ☐ I thrive on challenging situations, the more challenging the better.
 - ☐ In comparison to most people I know, I'm very involved in my work.
 - ☐ It seems as if I need thirty hours a day to finish all the things I'm faced with.
 - ☐ I've often been asked to be an officer of some group or groups.
4. All in all, how satisfied would you say you are with your job? (Check one)
- ☐ Not at all satisfied
- ☐ Somewhat satisfied
- ☐ Very satisfied
5. Knowing what you know now, if you had to decide it all over again whether to take the job you now have, what would you decide? (Check one)
- ☐ Decide definitely not to take the job
- ☐ Have some second thoughts
- ☐ Decide without hesitation to take the same job
6. In general, how well would you say your job measures up to the sort of job you wanted when you took it? (Check one)
- ☐ Very much like
- ☐ Somewhat like
- ☐ Not very much like
7. If a good friend of yours told you he (or she) was interested in working in a job like yours for your employer, what would you tell him (or her)? (Check one)
- ☐ Advise him (or her) against it
- ☐ Have doubts about recommending it
- ☐ Strongly recommend it
8. Circle the number which best describes how you see yourself in your work:
- Sad 1 2 3 4 5 6 7 Happy
 - Successful 1 2 3 4 5 6 7 Not successful
 - Important 1 2 3 4 5 6 7 Not important
 - Do my best 1 2 3 4 5 6 7 Not do my best

9. Please indicate how true you think each of the following statement is of your present job. (1=not at all true, 2=not too true, 3=not too true, 4=very true)
- a. ____ I have an opportunity to develop my own special skills and abilities.
 - b. ____ The work is interesting.
 - c. ____ I am given a lot of freedom to decide how I do my work.
 - d. ____ I am given a chance to do the things I like best.
 - e. ____ I can learn new things.
 - f. ____ I can use my skills, knowledge, and abilities.
 - g. ____ I can really believe in the value of what I'm doing.
 - h. ____ I can see the results of my own work.
 - i. ____ The pay is high.
 - j. ____ My job is very secure.
 - k. ____ The physical surroundings are very pleasant.
 - l. ____ The fringe benefits are generous.
 - m. ____ The job has status and prestige, that is, people look up to it and think it is important.
 - n. ____ My job is clearly important to the success of the company.
 - o. ____ It takes real skill and experience to do my job well.
 - p. ____ I have a good deal of influence over things that affect me or my job.
 - q. ____ I have some influence over plant or company policy.
 - r. ____ I can do the work and keep my mind on other things most of the time.
 - s. ____ I can talk to other people whenever I want to.
 - t. ____ I can usually decide when to work fast and when to take it easy.

S#: _____

Below you will find a series of statements. Please read each statement carefully and respond to it by expressing the extent to which you believe the statement applies to you. For all items, a response from 1 to 7 is required. Use (circle) the number that best reflects your belief when the scale is defined as follows:

1. The statement doesn't apply to me at all.
2. The statement usually doesn't apply to me.
3. Most often the statement doesn't apply to me.
4. I am unsure about whether or not the statement applies to me OR it applies to me about half the time.
5. The statement applies to me more often than not.
6. The statement usually applies to me.
7. The statement always applies to me.

IT IS IMPORTANT THAT YOU RESPOND TO ALL OF THE ITEMS

1. I prefer a job where I have a lot of control over what I do and when I do it.
1 2 3 4 5 6 7
2. I enjoy political participation because I want to have as much say in running things as possible.
1 2 3 4 5 6 7
3. I try to avoid situations where someone else tells me what to do.
1 2 3 4 5 6 7
4. I would prefer to be a leader rather than a follower.
1 2 3 4 5 6 7
5. I enjoy being able to influence the actions of others.
1 2 3 4 5 6 7

S#: _____

6. I am careful to check everything on an automobile before I leave for a long trip.
1 2 3 4 5 6 7
7. Others usually know what is best for me.
1 2 3 4 5 6 7
8. I enjoy making my own decisions.
1 2 3 4 5 6 7
9. I enjoy having control over my own destiny.
1 2 3 4 5 6 7
10. I would rather someone else took over the leadership role when I'm involved in a group project.
1 2 3 4 5 6 7
11. I consider myself to be generally more capable of handling situations than others are.
1 2 3 4 5 6 7
12. I'd rather run my own business and make my own mistakes than listen to someone else's orders.
1 2 3 4 5 6 7
13. I like to get a good idea of what a job is all about before I begin it.
1 2 3 4 5 6 7
14. When I see a problem I prefer to do something about it rather than sit by and let it continue.
1 2 3 4 5 6 7

S#: _____

15. When it comes to orders, I would rather give them than receive them.
1 2 3 4 5 6 7
16. I wish I could push many of life's daily decisions off on someone else.
1 2 3 4 5 6 7
17. When driving, I try to avoid putting myself in a situation where I could be hurt by someone else's mistake.
1 2 3 4 5 6 7
18. I prefer to avoid situations where someone else has to tell me what it is I should be doing.
1 2 3 4 5 6 7
19. There are many situations in which I would prefer only one choice rather than having to make a decision.
1 2 3 4 5 6 7
20. I like to wait and see if someone else is going to solve a problem so that I don't have to be bothered by it.
1 2 3 4 5 6 7
21. When I go out with other people, I usually make most of the arrangements.
1 2 3 4 5 6 7
22. I am comfortable lending my possessions (e.g. books and CDs) to my friends.
1 2 3 4 5 6 7
23. If I am going to an event (e.g. a lecture or a movie) which I expect will be crowded, I try to arrive early.
1 2 3 4 5 6 7

S#: _____

24. I almost never get things done until the last minute.
1 2 3 4 5 6 7
25. I like to gamble and play games of chance.
1 2 3 4 5 6 7
26. I would rather play an individual sport, such as tennis, than a team sport, such as basketball.
1 2 3 4 5 6 7
27. I don't mind other people scheduling my time.
1 2 3 4 5 6 7
28. I really get a kick out of driving a very responsive car.
1 2 3 4 5 6 7
29. I think it would be fun to be hypnotized.
1 2 3 4 5 6 7
30. I like to get high on alcohol or drugs.
1 2 3 4 5 6 7
31. I usually push an elevator button even if it is lighted, indicating that someone has already pushed it.
1 2 3 4 5 6 7

Subject #: _____

DEBRIEFING QUESTIONS & COMMENTS

1. During the time you were working on the tasks, listening to the noise, and answering the questionnaires did you feel you had any reason to believe this study was testing something other than the effects of noise on physiological, behavioral, & psychological processes?

Yes

No

2. If yes to # 1,
What were your reasons? _____

What else did you think was being tested? _____

3. Do you think the noise you were listening to while you were working on the comparison and arithmetic tasks interfered with your performance on the tasks?

Yes

No

4. Do you believe you could have done anything to stop the noise?

Yes

No

5. If yes to question 4, what do you believe you could have done?

6. Do you have any questions about the purpose of this study that you'd like to ask?

Yes

No

If yes, list questions _____

Appendix C

Subject Screening Form

Not Interested in Participating Form

Disqualified Respondent Form

Request To Discontinue Participation Form

Session Discontinuation Data

SUBJECT SCREENING FORM

DATE: ____-____-____

1. NAME: _____
 ADDRESS: _____

2. ARE YOU CURRENTLY AN EMPLOYEE OF USUHS?
 _____ Yes (DISQUALIFY) _____ No
3. HAVE YOU EVER PARTICIPATED IN A RESEARCH STUDY?
 _____ Yes _____ No (GO TO #9)
4. WAS THIS STUDY CONDUCTED AT THE USUHS?
 _____ Yes _____ No
5. WAS THIS STUDY CONDUCTED BY THE DEPARTMENT OF MEDICAL
 PSYCHOLOGY? _____ Yes _____ No
6. DID THIS STUDY INVOLVE LISTENING TO NOISE?
 _____ Yes (DISQUALIFY) _____ No
7. HOW RECENTLY DID YOU PARTICIPATE IN THIS STUDY?
 (Approximate date): _____
8. DID THIS STUDY INVOLVE:
 - a. COMPARING NUMBERS? _____ Yes _____ No
 - b. COMPARING CUBES? _____ Yes _____ No
 - c. DOING MENTAL ARITHMETIC? _____ Yes _____ No
 - d. WORKING ON COMPLEX
 FIGURES? _____ Yes _____ No

IF YES TO ANY OF THE ABOVE, DISQUALIFY IF PARTICIPATION
 OCCURRED WITHIN THE PAST SIX MONTHS

9. ARE YOU BETWEEN 30 & 50 YEARS OF AGE?
_____Yes _____No(DISQUALIFY)
10. DO YOU CURRENTLY SMOKE CIGARETTES OR USE OTHER TOBACCO PRODUCTS? _____Yes _____No
11. WHAT IS YOUR DATE OF BIRTH? _____-_____-_____ ('44-'64)
(DISQUALIFY IF NOT BETWEEN DATES)
12. WHAT CITY & STATE WERE YOU BORN IN?

13. IF YOU WERE NOT BORN IN THE U.S., ARE YOU NOW A U.S. CITIZEN? _____Yes _____No (DISQUALIFY)
14. IT MAY BE NECESSARY FOR ME TO CONTACT YOU BY PHONE LATER. DO YOU HAVE A NUMBER WHERE I CAN REACH YOU?
_____Yes _____No
HOME PHONE: _____
WORK PHONE: _____
OTHER PHONE: _____
(specify) _____
15. ARE YOU SELF-EMPLOYED? _____Yes (DISQUALIFY) _____No
16. ARE YOU SEASONALLY EMPLOYED?
_____Yes (DISQUALIFY) _____No
17. ARE YOU CURRENTLY EMPLOYED? _____Yes
_____No (Go to # 20)

18. If yes:

a. Are you employed full-time?

_____ Yes

_____ No (DISQUALIFY)

b. How long have you been working at your current job?

_____ Less than one year (DISQUALIFY)

_____ More than one year

19. For any reason, do you expect to leave your current job within the next year? _____ Yes (DISQUALIFY) _____ No

20. HAVE YOU BEEN HIRED FOR A JOB BUT HAVE NOT STARTED WORKING YET? _____ Yes (DISQUALIFY) _____ No

21. ARE YOU CURRENTLY LOOKING FOR WORK?

_____ Yes

_____ No

If no, would you please tell me the reason. _____

22. HOW LONG HAVE YOU BEEN UNEMPLOYED?

_____ less than 1 wk.

_____ 1 - 3 wks.

_____ 4 - 6 wks.

_____ 7 - 9 wks.

_____ 10 - 12 wks.

_____ 13 - 15 wks.

_____ 4 - 6 months.

_____ 6 - 12 months.

_____ 1 - 2 yrs.

(IF LONGER THAN 2 YEARS DISQUALIFY)

23. PLEASE DESCRIBE YOUR OCCUPATION:

DISQUALIFIED: _____ Yes

_____ No

24. ARE YOU CURRENTLY SEEING A DOCTOR OR THERAPIST FOR A SPECIFIC PROBLEM? _____ Yes _____ No

If yes, please describe the problem.

DISQUALIFIED: _____ Yes _____ No

25. ARE YOU CURRENTLY TAKING ANY MEDICATIONS INCLUDING PRESCRIPTION & OVER THE COUNTER DRUGS?
_____ Yes _____ No

If yes, what are you taking?

DISQUALIFIED: _____ Yes _____ No

26. ARE YOU HEARING IMPAIRED? _____ Yes (DISQUALIFY) _____ No

27. HAVE YOU EVER HAD ANY TYPE OF HEARING PROBLEM?

_____ Yes _____ No

Please describe: _____

28. HAVE YOU EVER BEEN DIAGNOSED OR TREATED FOR:

- a. HIGH BLOOD PRESSURE? _____ Yes (DISQUALIFY) _____ No
(HYPERTENSION)
- b. ANY HEART DISORDERS? _____ Yes (DISQUALIFY) _____ No
- c. PANIC DISORDER? _____ Yes (DISQUALIFY) _____ No
- d. PSYCHIATRIC ILLNESS? _____ Yes (DISQUALIFY) _____ No
- e. ANXIETY? _____ Yes (DISQUALIFY) _____ No
- f. RECURRING NIGHTMARES? _____ Yes (DISQUALIFY) _____ No
- g. FLASHBACK ASSOCIATED WITH LOUD NOISES?
_____ Yes (DISQUALIFY) _____ No
- h. POST TRAUMATIC STRESS
DISORDER (PTSD)? _____ Yes (DISQUALIFY) _____ No

29. DO YOU DRINK MORE THAN 5 BEVERAGES CONTAINING CAFFEINE
(SUCH AS COFFEE, COKE, OR PEPSI) A DAY?
_____ Yes (DISQUALIFY) _____ No

30. APPROXIMATELY HOW OFTEN DO YOU DRINK ALCOHOLIC
BEVERAGES?

_____ Daily ****
 _____ Several times a week
 _____ A few times a month
 _____ On special occasions
 _____ Rarely
 _____ Never

**(IF DAILY) WHAT TYPE & HOW MANY DRINKS DO YOU CONSUME?

 (DISQUALIFY IF EXCESSIVE)

31. IF NECESSARY, ASK RESPONDENT IF HE WOULD HAVE ANY
PROBLEM READING & COMPLETING THE QUESTIONNAIRES
_____ Yes (DISQUALIFY) _____ No

I ONLY HAVE A FEW MORE QUESTIONS. THESE HAVE TO DO WITH A VARIETY OF TRAUMATIC EVENTS THAT YOU MAY OR MAY NOT HAVE EXPERIENCED. THE REASON I'M ASKING IF ANY OF THESE EVENTS HAVE HAPPENED TO YOU IS THAT SOMETIMES THEY MAY HAVE LONG-TERM EFFECTS ON PEOPLES' LIVES & MAY AFFECT YOUR RESPONSES & BEHAVIOR DURING THIS STUDY.

1. Have you personally experienced a traumatic event or situation either as a result of an accident or physical violence that has threatened your life or well-being?

_____No _____Yes

If yes, please specify

If yes, does this event affect you in any of the following ways:

- a. Have recurrent or intrusive thoughts about it?
_____No _____Yes (DISQUALIFY)
- b. Nightmares about it?
_____No _____Yes (DISQUALIFY)
- c. A feeling that this event is recurring again?
_____No _____Yes (DISQUALIFY)
- d. Psychological distress when exposed to events that symbolize or resemble an aspect of the event?
_____No _____Yes (DISQUALIFY)
- e. Persistently avoid thoughts, feelings, activities, or situations that remind you of the event.
_____No _____Yes (DISQUALIFY)
- f. Are you currently experiencing difficulties falling asleep or concentrating, irritability, or outbursts of anger, an exaggerated startle response, or any other symptom you feel is related to this event or situation?
_____No _____Yes (DISQUALIFY)

2. Has any member of your family or other close relatives or friends experienced an event or situation either as a result of an accident or physical violence that has threatened their life or well-being?

_____ No _____ Yes

If yes, please specify

If yes, does this event affect you in any of the following ways:

- a. Have recurrent or intrusive thoughts about it?
_____ No _____ Yes (DISQUALIFY)
- b. Nightmares about it?
_____ No _____ Yes (DISQUALIFY)
- c. A feeling that this event is recurring again?
_____ No _____ Yes (DISQUALIFY)
- d. Psychological distress when exposed to events that symbolize or resemble an aspect of the event?
_____ No _____ Yes (DISQUALIFY)
- e. Persistently avoid thoughts, feelings, activities, or situations that remind you of the event.
_____ No _____ Yes (DISQUALIFY)
- f. Are you currently experiencing difficulties falling asleep or concentrating, irritability or outbursts of anger, an exaggerated startle response, or any other symptom you feel is related to this event or situation?
_____ No _____ Yes (DISQUALIFY)

3. Has your home or community ever been destroyed by some type of disaster?

_____No

_____Yes

If yes, please specify

If yes, does this event affect you in any of the following ways:

- a. Have recurrent or intrusive thoughts about it?
 _____No _____Yes (DISQUALIFY)
- b. Nightmares about it?
 _____No _____Yes (DISQUALIFY)
- c. A feeling that this event is recurring again?
 _____No _____Yes (DISQUALIFY)
- d. Psychological distress when exposed to events that symbolize or resemble an aspect of the event?
 _____No _____Yes (DISQUALIFY)
- e. Persistently avoid thoughts, feelings, activities, or situations that remind you of the event.
 _____No _____Yes (DISQUALIFY)
- f. Are you currently experiencing difficulties falling asleep or concentrating, irritability or outbursts of anger, an exaggerated startle response, or any other symptom you feel is related to this event or situation?
 _____No _____Yes (DISQUALIFY)

4. Have you ever seen another person who has been seriously injured or killed as the result of an accident, military action, or physical violence?

_____ No _____ Yes

If yes, please specify

If yes, does this event affect you in any of the following ways:

- a. Have recurrent or intrusive thoughts about it?

_____ No _____ Yes (DISQUALIFY)

- b. Nightmares about it?

_____ No _____ Yes (DISQUALIFY)

- c. A feeling that this event is recurring again?

_____ No _____ Yes (DISQUALIFY)

- d. Psychological distress when exposed to events that symbolize or resemble an aspect of the event?

_____ No _____ Yes (DISQUALIFY)

- e. Persistently avoid thoughts, feelings, activities, or situations that remind you of the event.

_____ No _____ Yes (DISQUALIFY)

- f. Are you currently experiencing difficulties falling asleep or concentrating, irritability or outbursts of anger, an exaggerated startle response, or any other symptom you feel is related to this event or situation?

_____ No _____ Yes (DISQUALIFY)

DISQUALIFICATION:

- _____01 Female
- _____02 USUHS Employee/Student
- _____03 Participation in prior noise study
- _____04 Cognitive tasks within last 6mos.
- _____05 Tobacco use
- _____06 Age
- _____07 Not born in US or citizen
- _____08 Self-employed
- _____09 Seasonally employed
- _____10 E, not full-time employed
- _____11 Currently E less than 1 yr.
- _____12 Currently E, leaving within 1 yr.
- _____13 Current UNE, starting work soon
- _____14 UNE, problem re: job hunting
- _____15 UNE more than two years
- _____16 Occupational status
- _____17 Current medical problem
- _____18 Current meds confound
- _____19 Hearing Impaired
- _____20 Hearing Problem
- _____21 High blood pressure
- _____22 Heart disorder
- _____23 Panic disorder
- _____24 Psychiatric illness
- _____25 Anxiety disorder
- _____26 Recurring nightmares
- _____27 Flashbacks, loud noises
- _____28 PTSD
- _____29 Excessive caffeine use
- _____30 Excessive alcohol use
- _____31 Language problem
- _____32 DSMIII - traumatic event 1
- _____33 DSMIII - traumatic event 2
- _____34 DSMIII - traumatic event 3
- _____35 DSMIII - traumatic event 4

NOT INTERESTED IN PARTICIPATING DATA

DATE: ____-____-____

REASON NOT INTERESTED: _____

RESPONDENT IS: _____ Currently employed
 _____ Currently unemployed

LENGTH OF UNEMPLOYMENT IF RELEVANT: _____

SELF-DESCRIBED OCCUPATION: _____

1. MARITAL STATUS: _____ Single _____ Married
 _____ Separated _____ Divorced
 _____ Widowed _____ Other _____

2. HIGHEST EDUCATIONAL LEVEL: _____ Elementary school
 _____ Jr. HS _____ HS diploma _____ GED Diploma
 _____ Tech school _____ Some college _____ AB degree
 _____ BA or BS degree _____ Graduate work _____ Master's degree
 _____ PhD
 _____ Other (specify) _____

3. WOULD YOU DESCRIBE YOURSELF AS: _____ Asian _____ Black
 _____ Caucasian (White) _____ Hispanic _____ Native American
 _____ Other (specify) _____

4. Were you born in the United States? _____ Yes _____ No
 If no, are you a U.S. citizen? _____ Yes _____ No
 If no, are you a permanent resident? _____ Yes _____ No
 If no, please specify: _____

5. What is your personal approximate annual income this year:

- ☐ Under \$5,000 per year
- ☐ \$5,000 - \$10,000 per year
- ☐ \$10,000 - \$15,000 per year
- ☐ \$15,000 - \$20,000 per year
- ☐ \$20,000 - \$30,000 per year
- ☐ \$30,001 - \$40,000 per year
- ☐ \$40,001 - \$50,000 per year
- ☐ over \$50,000 per year

6. What is your household approximate annual income this year:

- ☐ Under \$5,000 per year
- ☐ \$5,001 - \$10,000 per year
- ☐ \$10,001 - \$15,000 per year
- ☐ \$15,001 - \$20,000 per year
- ☐ \$20,001 - \$30,000 per year
- ☐ \$30,001 - \$40,000 per year
- ☐ \$40,001 - \$50,000 per year
- ☐ \$50,001 - \$60,000 per year
- ☐ \$60,001 - \$70,000 per year
- ☐ \$70,001 - \$80,000 per year
- ☐ \$80,001 - \$90,000 per year
- ☐ \$90,001 - \$99,999 per year
- ☐ over \$100,000 per year

DISQUALIFIED RESPONDENT DATA

DATE: ____-____-____

DISQUALIFICATION BASED ON: _____

_____DISQUALIFIED DURING SCREENING? ____ Yes ____ No
If no, who was consulted? _____

If no, what date was the subject informed? ____-____-____

DATE OF BIRTH: ____-____-____

RESPONDENT IS: ____ Currently employed
____ Currently unemployed

LENGTH OF UNEMPLOYMENT IF RELEVANT: _____

SELF-DESCRIBED OCCUPATION: _____

_____1. MARITAL STATUS: ____ Single ____ Married
____ Separated ____ Divorced
____ Widowed ____ Other _____2. HIGHEST EDUCATIONAL LEVEL: ____ Elementary school
____ Jr. HS ____ HS diploma ____ GED Diploma
____ Tech school ____ Some college ____ AB degree
____ BA or BS degree ____ Graduate work
____ Master's degree ____ PhD
____ Other (specify) _____

3. WOULD YOU DESCRIBE YOURSELF AS: ☐ Asian ☐ Black
☐ Caucasian (White) ☐ Hispanic ☐ Native American
☐ Other (specify) _____

4. Were you born in the United States? ☐ Yes ☐ No
 If no, are you a U.S. citizen? ☐ Yes ☐ No
 If no, are you a permanent resident? ☐ Yes ☐ No
 If no, please specify: _____

5. What is your personal approximate annual income this year:

☐ Under \$5,000 per year
☐ \$5,000 - \$10,000 per year
☐ \$10,000 - \$15,000 per year
☐ \$15,000 - \$20,000 per year
☐ \$20,000 - \$30,000 per year
☐ \$30,001 - \$40,000 per year
☐ \$40,001 - \$50,000 per year
☐ over \$50,000 per year

6. What is your household approximate annual income this year:

☐ Under \$5,000 per year
☐ \$5,001 - \$10,000 per year
☐ \$10,001 - \$15,000 per year
☐ \$15,001 - \$20,000 per year
☐ \$20,001 - \$30,000 per year
☐ \$30,001 - \$40,000 per year
☐ \$40,001 - \$50,000 per year
☐ over \$50,000 per year



UNIFORMED SERVICES UNIVERSITY OF THE HEALTH SCIENCES

4301 JONES BRIDGE ROAD
BETHESDA, MARYLAND 20814-4799



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REQUEST TO DISCONTINUE PARTICIPATION

PROJECT NUMBER C07205 - 16 ADDENDUM

STUDY TITLE: The Effects of Noise on Physiological, Behavioral,
and Psychological Processes

I have indicated to the experimenter that I wish to terminate my participation in this study. For our records, we would appreciate knowing why you decided to stop the session. Please feel free to list your reasons or comments in the spaces provided below.

MY SIGNATURE INDICATES THAT ACCORDING TO MY WISHES, THE EXPERIMENTER DISCONTINUED THE LABORATORY SESSION, INFORMED ME OF THE PURPOSE OF THIS STUDY AND PAID ME FOR MY PARTICIPATION. I WAS GIVEN THE OPPORTUNITY TO LISTEN TO THE DEBRIEFING PORTION OF THE SESSION & RECEIVED A COPY OF THE DEBRIEFING FORM.

Subject's Signature

Date

Experimenter's Signature

Date

S#: _____

SESSION DISCONTINUATION DATA

For the following circled reason(s), the experimenter was required to discontinue this study.

1. Participant in the control condition used the noise switch.
2. Participant in the no control condition used the noise switch.
3. Subject appeared extremely distressed but did not request termination.
4. Subject was uncooperative or abusive.
5. Subject requested termination.

REMARKS: _____

This subject was paid and informed of the reason the session was discontinued. Debriefing was offered and the debriefing form was given to the subject by the experimenter.

SUBJECT LISTENED TO THE DEBRIEFING	_____ Yes	_____ No
SUBJECT SIGNED DEBRIEFING FORM	_____ Yes	_____ No
SUBJECT WALKED OUT, REFUSING PAYMENT	_____ Yes	_____ No
SUBJECT REFUSED TO LISTEN TO DEBRIEF, WAS PAID	_____ Yes	_____ No
SUBJECT REFUSED TO SIGN DEBRIEF, WAS PAID	_____ Yes	_____ No

Appendix D

Cognitive Task Booklet (with sample answer pages)

Embedded Figures Task Booklet - Form A

Subject Number: _____

COGNITIVE TASK RESPONSE BOOKLET

EXAMPLE #1**INSTRUCTIONS:**

You need to inspect pairs of multidigit numbers and decide whether the numbers are the same or different. Indicate your decision by circling the word “same” or “different” in this response booklet. That is, if you decide that the multidigit numbers on the slide are the same, then circle the word “SAME” in your book. If you think they aren’t, then circle the word “DIFFERENT”.

EXAMPLE #2**INSTRUCTIONS:**

You need to rapidly compute solutions to math problems and write your answer to each problem in this response booklet. These problems include addition, subtraction, and multiplication and there will be a total of 8 problems on each slide.

EXAMPLE #3**INSTRUCTIONS:**

You need to inspect pairs of cubes and decide whether the cubes are the same or different. Each cube will have letters and symbols on different faces, resembling children’s alphabet blocks. You need to decide if the two blocks could be the same, but are oriented differently (for example, one cube has the same faces as the other, but is turned upside-down) OR if they are different blocks because of the arrangement of the letters and symbols. Each symbol or letter appears only once on each block. Indicate your decision by circling the word “same” or “different” in the response booklet. That is, if you decide that the blocks on the slide are the same, then circle the word “SAME” in your book. If you think they aren’t, then circle the word “DIFFERENT”. If you think that you cannot tell if the cubes are the same or different from the information given, then write “NA” on the line provided. There will be one pair of cubes per slide.

EXAMPLE TASKS:

ex1. SAME DIFFERENT _____

ex2. SAME DIFFERENT _____

ex3. SAME DIFFERENT _____

1	SAME DIFFERENT	_____
2	SAME DIFFERENT	_____
3	SAME DIFFERENT	_____
4	SAME DIFFERENT	_____
5	SAME DIFFERENT	_____
6	SAME DIFFERENT	_____
7	SAME DIFFERENT	_____
8	SAME DIFFERENT	_____
9	SAME DIFFERENT	_____
10	SAME DIFFERENT	_____

75 SAME DIFFERENT

76 SAME DIFFERENT

STOP - TURN TO NEXT PAGE WHEN EXPERIMENTER SAYS BEGIN

144	SAME	DIFFERENT	_____
145	SAME	DIFFERENT	_____
146	SAME	DIFFERENT	_____
147	SAME	DIFFERENT	_____
148	SAME	DIFFERENT	_____
149	SAME	DIFFERENT	_____
150	SAME	DIFFERENT	_____
151	SAME	DIFFERENT	_____
152	SAME	DIFFERENT	_____
153	SAME	DIFFERENT	_____
154	SAME	DIFFERENT	_____

STOP - PLEASE CLOSE YOUR BOOKLET AND WAIT FOR THE EXPERIMENTER

EMBEDDED FIGURES TASK

FORM A

THE EMBEDDED FIGURES TASK (EFT) IS AN EXPERIMENTAL TOOL THAT IS USED IN PSYCHOLOGICAL RESEARCH. THIS FORM OF THE EFT CONTAINS ONE PRACTICE ITEM, SEVERAL QUESTIONNAIRES, AND SIXTEEN EFT TASKS. IN PREVIOUS STUDIES, SOME PEOPLE HAVE FOUND THESE TASKS TO BE VERY DIFFICULT WHILE OTHERS HAVE NOT.

THE QUESTIONNAIRES INCLUDED IN THIS FORM HAVE TO DO WITH YOUR OPINIONS AND WHAT YOU ARE THINKING ABOUT BEFORE, DURING, AND AFTER THE TASKS. PLEASE ANSWER THE QUESTIONS AS ACCURATELY AS YOU CAN.

DO NOT OPEN THIS FORM UNTIL THE EXPERIMENTER TELLS YOU TO DO SO.

Before beginning work on the tasks, we would like you to answer the following questions. Some may seem strange or may be difficult to answer, but please answer each one. After you complete this section (2 pages) please tell the experimenter and turn to the next page. The experimenter will be giving you further instructions. The following questions ask about your thoughts and how you are feeling about working on the tasks. Please circle the number that best describes how you are feeling or your thoughts about the testing session.

1. The tests will not bother me because I think I can handle the situation.

1	2	3	4	5	6	7
Not true at all						Very True

2. I feel uncomfortable about the test session.

1	2	3	4	5	6	7
Not true at all						Very True

3. I think I can find a way to do well during the test session.

1	2	3	4	5	6	7
Not true at all						Very True

4. The test session will be challenging but I am not overly concerned about it.

1	2	3	4	5	6	7
Not true at all						Very True

5. The test session is somewhat threatening.

1	2	3	4	5	6	7
Not true at all						Very True

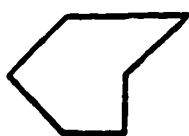
6. I do not think I am going to have much control over how well I do on the tests.

1	2	3	4	5	6	7
Not true at all						Very True

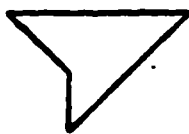
7. The practice puzzle you will see will provide you with information about how well you will do on the EFT. Do you think that this information will:
- _____ give no useful information about it?
- _____ determine how hard or easy it will be?
- _____ determine how hard you will have to work on it?
8. What kind of information do you want most from the practice puzzle?
- _____ Information about the difficulty of the EFT (how hard it is, whether or not the puzzles can be solved).
- _____ Information about the abilities you have on the EFT (whether you have the skills needed to solve its items).
- _____ Information about the effort required on the EFT items (how hard you will have to work).
- _____ No information particularly wanted.
9. How likely do you feel you are to do well?
- | | | | | | | |
|----------|----------|----------|----------|----------|----------|----------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> | <u>7</u> |
| unlikely | | | | | | likely |
10. How well do you think you are "supposed" to do on the EFT?
- (How well do you think we expect you to do?)
- | | | | | | | |
|---------------|----------|----------|----------|----------|----------|-----------|
| <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> | <u>7</u> |
| not very well | | | | | | very well |

**** PLEASE STOP AFTER ANSWERING ALL THE QUESTIONS,
TELL THE EXPERIMENTER YOU ARE FINISHED,
AND TURN TO THE NEXT PAGE ****

This is a test of your ability to tell which one of five simple figures can be found in a more complex pattern. The five simple figures are lettered A, B, C, D and E. Indicate the apparent simple pattern by outlining it in the complex pattern and marking the corresponding letter below the complex pattern. There is only one of these figures in each pattern, and this figure will always be right side up and exactly the same size as one of the figures at the top of the page.



A



B



C

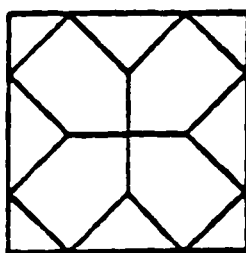


D



E

Example:



A B C D E

QUESTIONS:

1. How hard did you try to solve these three puzzles?

[illegible]

2. You have learned something about the EFT from working on these items. What was the most important thing you learned?

 About my ability on the EFT.

_____ About how hard I must work on it.

 About how hard the EFT is.

3. What is the most important thing to learn about the EFT from the next items?

 About my abilities on the EFT.

 About how hard I must work on it.

_____ About how hard the EFT is.

Nothing important to learn.

4. How well do you think you are "supposed" to do on the EFT? (How well do you think we expect you to do?)

[illegible]

5. What do you think is the most important reason for your performance so far?

 The difficulty of the EFT.

_____ The effort needed.

The abilities needed.

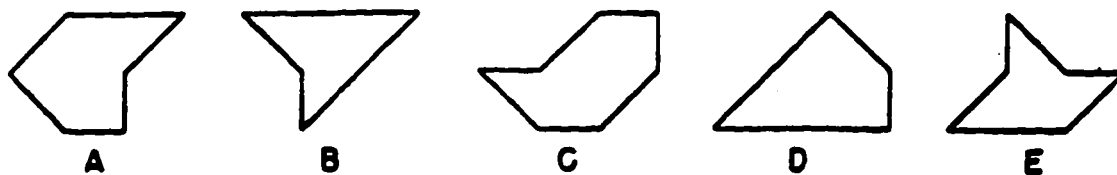
6. How hard do you plan to work on the next items?

[illegible]

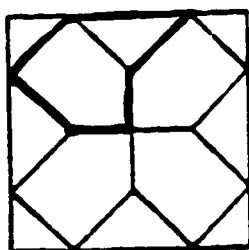
7. How important is it to you to do well on the EFT?

1
2
3
4
5
6
7

not important
important



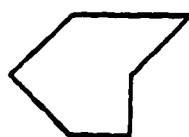
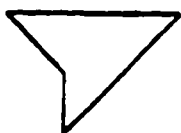
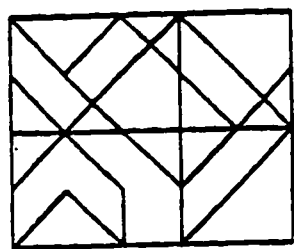
Solution:



A B C D E

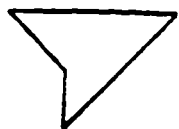
NOTE: You must outline each simple figure you find as well as circle the corresponding letter.

STOP. Please wait for instruction.

**A****B****C****D****E****A B C D E**



A



B



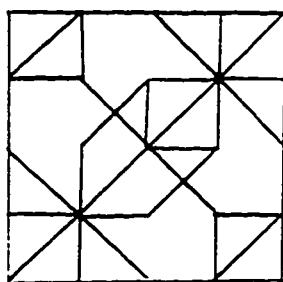
C



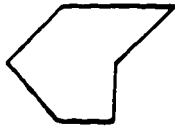
D



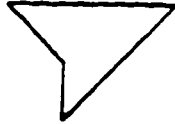
E



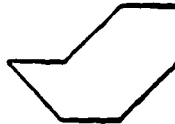
A B C D E



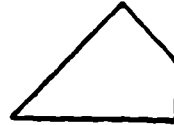
A



B



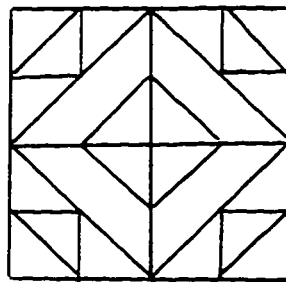
C



D



E



A B C D E

QUESTIONS:

1. How hard did you try to solve these three puzzles?

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
not hard						hard

2. You have learned something about the EFT from working on these items. What was the most important thing you learned?

_____ About my ability on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

3. What is the most important thing to learn about the EFT from the next items?

_____ About my abilities on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

_____ Nothing important to learn.

4. How well do you think you are "supposed" to do on the EFT? (How well do you think we expect you to do?)

<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
not very well						very well

5. What do you think is the most important reason for your performance so far?

_____ The difficulty of the EFT.

_____ The effort needed.

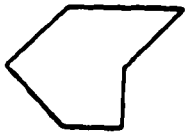
_____ The abilities needed.

6. How hard do you plan to work on the next items?

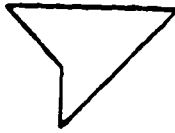
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
not hard						hard

7. How important is it to you to do well on the EFT?

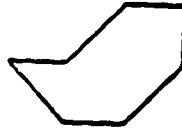
<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>
not important						important



A



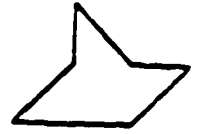
B



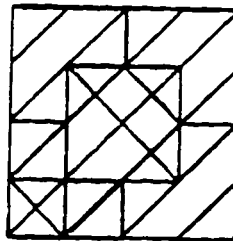
C



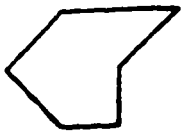
D



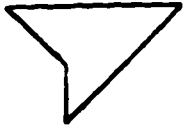
E



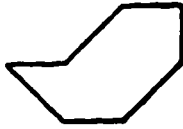
A B C D E



A



B



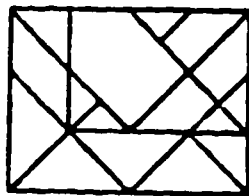
C



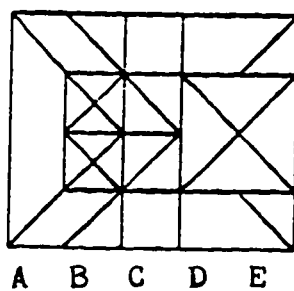
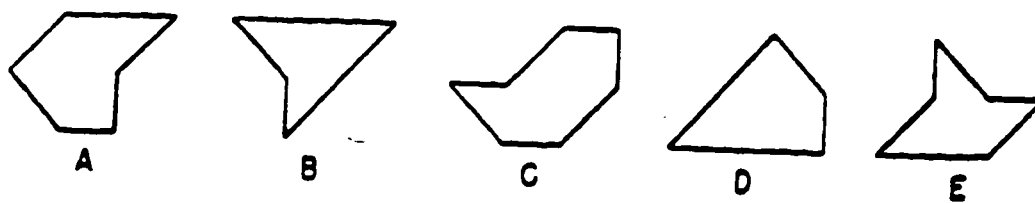
D



E



A B C D E



QUESTIONS:

1. How hard did you try to solve these three puzzles?

[illegible]

2. You have learned something about the EFT from working on these items. What was the most important thing you learned?

 About my ability on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

3. What is the most important thing to learn about the EFT from the next items?

 About my abilities on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

 Nothing important to learn.

4. How well do you think you are "supposed" to do on the EFT? (How well do you think we expect you to do?)

1 2 3 4 5 6 7

not very well very well

5. What do you think is the most important reason for your performance so far?

 The difficulty of the EFT.

 The effort needed.

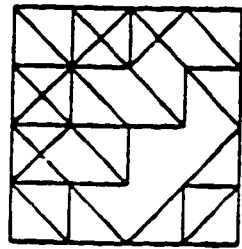
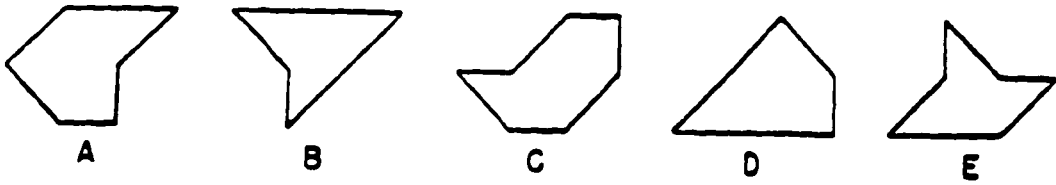
The abilities needed.

6. How hard do you plan to work on the next items?

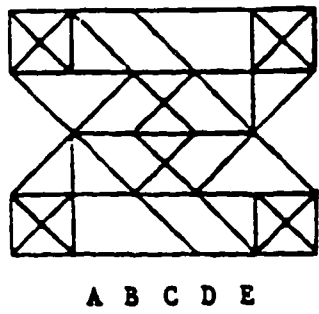
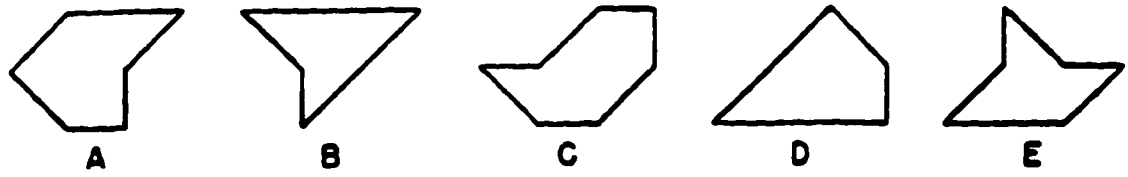
[illegible]

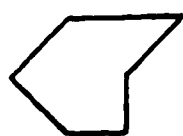
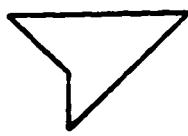
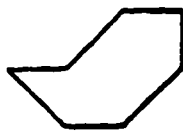
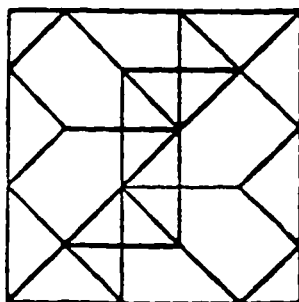
7. How important is it to you to do well on the EFT?

[illegible]



A B C D E



**A****B****C****D****E****A B C D E**

QUESTIONS:

1. How hard did you try to solve these three puzzles?

[illegible]

2. You have learned something about the EFT from working on these items. What was the most important thing you learned?

_____ About my ability on the EFT.

_____ About how hard I must work on it.

About how hard the EFT is.

3. What is the most important thing to learn about the EFT from the next items?

_____ About my abilities on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

Nothing important to learn.

4. How well do you think you are "supposed" to do on the EFT? (How well do you think we expect you to do?)

1
2
3
4
5
6
7
 not very well very well

5. What do you think is the most important reason for your performance so far?

_____ The difficulty of the EFT.

 The effort needed.

The abilities needed.

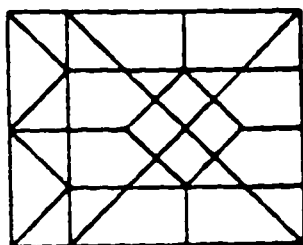
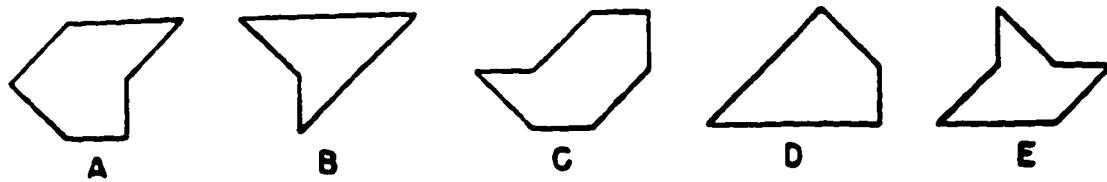
6. How hard do you plan to work on the next items?

[illegible]

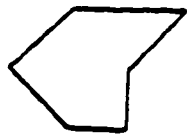
7. How important is it to you to do well on the EFT?

1
2
3
4
5
6
7

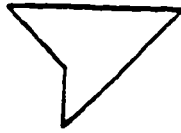
not important
important



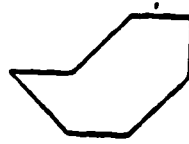
A B C D E



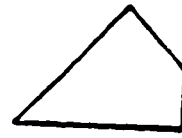
A



B



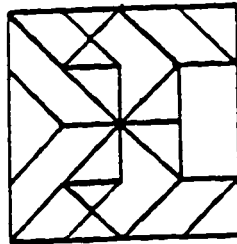
C



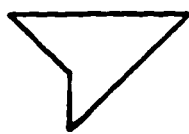
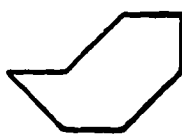
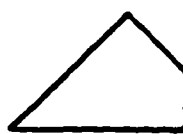
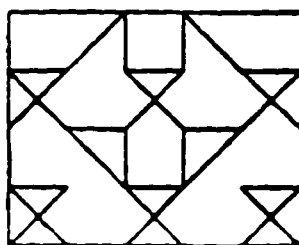
D



E



A B C D E

**A****B****C****D****E****A B C D E**

QUESTIONS:

1. How hard did you try to solve these three puzzles?

1 2 3 4 5 6 7

not hard hard

2. You have learned something about the EFT from working on these items. What was the most important thing you learned?

 About my ability on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

3. What is the most important thing to learn about the EFT from the next items?

 About my abilities on the EFT.

_____ About how hard I must work on it.

_____ About how hard the EFT is.

Nothing important to learn.

4. How well do you think you are “supposed” to do on the EFT? (How well do you think we expect you to do?)

1
2
3
4
5
6
7

not very well
very well

5. What do you think is the most important reason for your performance so far?

 The difficulty of the EFT.

 The effort needed.

The abilities needed.

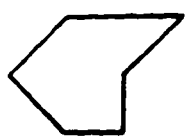
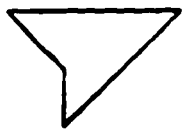
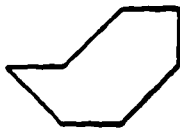
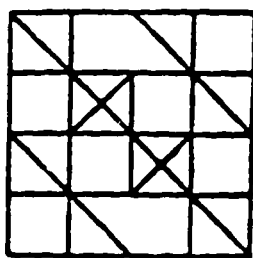
6. How hard do you plan to work on the next items?

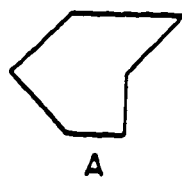
[illegible]

7. How important is it to you to do well on the EFT?

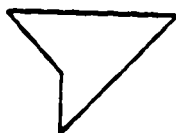
1
2
3
4
5
6
7

not important
important

**A****B****C****D****E****A B C D E**



A



B



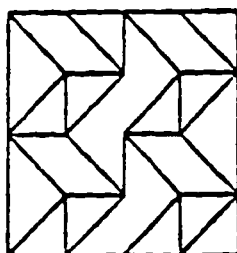
C



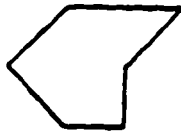
D



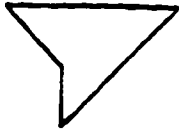
E



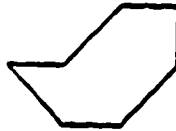
A B C D E



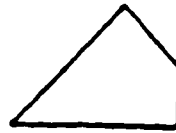
A



B



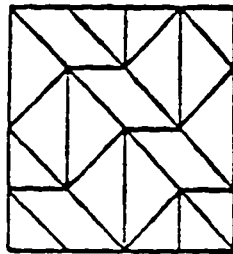
C



D



E



A B C D E

QUESTIONS:

1. How hard did you try to solve these three puzzles?

$\frac{1}{\text{not hard}}$ $\frac{2}{\phantom{\text{not hard}}}$ $\frac{3}{\phantom{\text{not hard}}}$ $\frac{4}{\phantom{\text{not hard}}}$ $\frac{5}{\phantom{\text{not hard}}}$ $\frac{6}{\phantom{\text{not hard}}}$ $\frac{7}{\text{hard}}$

2. You have learned something about the EFT from working on these items. What was the most important thing you learned?

 About my ability on the EFT.

 About how hard I must work on it.

 About how hard the EFT is.

3. What is the most important thing to learn about the EFT from the next items?

 About my abilities on the EFT.

 About how hard I must work on it.

_____ About how hard the EFT is.

Nothing important to learn.

4. How well do you think you are "supposed" to do on the EFT? (How well do you think we expect you to do?)

1234567
 not very wellvery well

5. What do you think is the most important reason for your performance so far?

 The difficulty of the EFT.

 The effort needed.

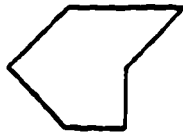
The abilities needed.

6. How hard do you plan to work on the next items?

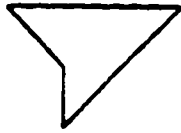
[illegible]

7. How important is it to you to do well on the EFT?

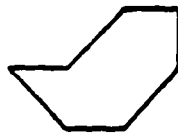
1
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5
6
7
 not important important



A



B



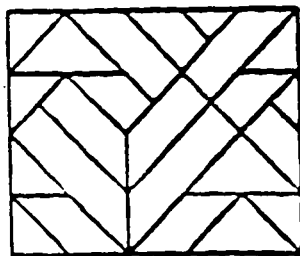
C



D



E



A B C D E

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